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Sanitary Survey Manual

for

Public Water Supplies

Tennessee Department of Environment and Conservation

Division of Water Supply

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Introduction

The purpose of this manual is to assist staff members of the Division of Water Supply in conducting a sanitary survey of a public water system. It can also be used by a public water system (PWS) to conduct an internal review of their system. PWSs are encouraged to conduct self-assessments of their system using this manual and correct any deficiencies identified. A PWS is one that serves 15 or more connections and/or 25 or more individuals sixty days a year. This manual applies to community water systems (CWSs), Non-transient non-water systems (NTNCWSs) and transient non-community water systems (TNCWSs). This manual will also insure that the on-site investigations of public water systems (PWSs) in Tennessee will be conducted in the same manner statewide. Both existing staff members and new employees will benefit from having this manual. The new employee will have a written procedure to help them prepare and conduct a sanitary survey while an existing staff member will be able to refresh their memory.

A sanitary survey is an onsite evaluation and documentation of a water system's capabilities, operations, sources, facilities, treatment process, equipment, distribution network, monitoring, reporting and data verification, pump, pump facilities and controls and overall management to continually provide safe drinking water and to identify any deficiencies that might impact the continued provision of safe drinking water. Sanitary surveys provide an opportunity for inspectors to establish a field presence with the owners and operators of water systems in order to educate them about proper monitoring and sampling procedures, provide technical assistance, and inform them of any upcoming changes in regulations.

Sanitary Surveys should not be announced to system personnel, except where absolutely necessary. Circumstances which may warrant advance notice prior to conducting the inspection, include water systems which are likely to be closed to inspectors should the inspection to be unannounced (small, rural churches, etc.).

Overall, the sanitary survey consists of a review of past records and documents on the operation of a water system, an on-site inspection of both records and the operation and maintenance of the system, and a determination of potential problems which may affect the quality and/or quantity of water produced in the future. Sanitary Surveys are generally broad and comprehensive in nature. They usually do not focus on specific problems or issues unless major discrepancies or omissions are evident or encountered. Where warranted, more specific or detailed reviews may be conducted, e.g. a review of a system's cross connection program, or a review of operating laboratory procedures, etc. the person conducting the sanitary survey must have a basic understanding of the unit processes and chemistry used in water treatment and a knowledge of the Tennessee Safe Drinking Water Act (TSDWA) and the regulations which govern a water utility.

This manual has been divided into two major parts. The first portion of the manual deals with setting up the sanitary survey, conducting the field inspection, and preparing the report (survey letter) documenting the findings of the inspection. The second portion of the manual contains the guidance, inspection sheets, sample letters, etc. to be used as a reference.

Items that apply to specific categories of public water systems are shown in the graphic boxes. Generally the explanation of the item will elaborate as to what systems are applicable under the requirement. Furthermore, items are grouped under the major headings of "Records," "Facility, Distribution System," etc. For example under "Records," only TNCWSs with a True Ground Water source are not required to disinfect and maintain or submit the records associated with that activity (p. 4). On the other hand, all CWSs with more than 50 connections are required to disinfect and to have a duplicate chlorination system (p. 24). The definition of duplicate chlorination can be found in Division Rule 1200-5-1-.17(11). Systems failing to have duplicate units will be penalized. Systems having a continuous monitoring device with an alarm notifying a manned control center may be exempt from the duplicate

chlorination requirement. Deficiencies in the operation of a treatment facility may be cited under the "Operation" category. The "Water Quality Monitoring" section determines whether a system performs the required sampling and analyses. Violations of established standards resulting from these analyses are to be assessed under "Water Quality."

It is recommended that a copy of the current rules and regulations and TSDWA be attached to this manual for reference also.

It should be remembered that it is impossible to describe everything in this manual that should be considered when conducting a sanitary survey. The person conducting the survey must be thoroughly knowledgeable of the operation of a public water system and the requirements the system must meet and use professional judgment in evaluating a facility.

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General Outline to Conducting a Sanitary Survey

I. Preparation

The preparation phase is one of the keys to conducting a thorough sanitary survey. Adequate preparation provides better credibility with the water system and leads to more efficient use of time by preventing unnecessary return trips. In preparing for a sanitary survey, records and activities of the water system will be reviewed for the period since the last sanitary survey. In general, deficiencies will be assessed for violations that have occurred since the last sanitary survey. For violations which were noted in the last survey; deficiencies will be assessed at twice the value. Application of this procedure will apply to all violations except for those monitoring and Maximum Contaminant Level (MCL) bacteriological violations that have occurred in the past 12 months. Enforcement action by the Division of Water Supply (DWS) may be taken against a public water system (PWS) and/or Certified Operator (COP) of the system at any time.

(A) **Correspondence**

System Category

CWS (Community Water System)	NTNCWS (Non-Transient Non-Community Water System	TNCWS (Non-Transient Non-Community Water System

One of the first items the inspector will check is the system's correspondence file which should contain previous sanitary survey results, complaints, Notices of Violation (NOVs), Notices of Non-compliance (NONCs), enforcement correspondence, letters from the plans review group (Engineering Section) on expansion/renovation of the plant or distribution system, notices of construction starts, results from other inspections, etc. Past sanitary survey results are an important part of the preparation process. Letters from several previous surveys should be reviewed to determine if there are persistent problems and how the system has responded to deficiencies cited by the Division. Deficiencies from the most recent survey should be noted so that those items can be checked more closely during the on-site survey.

(B) **Complaints**

System Category

CWS (Community Water System)		

If the water system is a community water system the system's complaint file needs to be examined as several areas of the survey relate to problems that occur in the distribution system. The state's file of complaints on a system should be compared with the system's file. Where the complainant has noted they have informed the system of the problem and the complaint has not been logged by the system may indicate the system

is not logging them or records are inaccurate or misleading. Consideration should be given, however, in that some complainants may not have registered a complaint with the utility. Deficiencies can be assessed, however, if a system has red water complaints and violates the **secondary standards** (Rule 1200-5-1-.12), or there are numerous odor complaints and evidence reveals inadequate chlorine residual in areas of the distribution system. These problems generally indicate the lack of, or ineffectiveness of a flushing program or low-pressure problems.

(C) **Construction Projects**

System Category		
CWS (Community Water System)	**NTNCWS (Non-Transient Non-Community Water System**	**TNCWS (Non-Transient Non-Community Water System**

If the file contains letters from the Engineering Section of the Division approving plans and specifications for construction then the inspector should check to make sure the water system has met its construction obligations. The inspector should note whether the file constains "Approvals" for the **replacement** or **up-grading** of any problem lines within the system. Plans are required for **all** new construction, including the installation of hydrants. **The only exception regarding plans is the replacement of lines with the same size lines of less than 200 feet.** Plans and/or sketches of **cartridge filter systems** should be in the system's file if the system is a NTNCWS and ground water under the direct influence of surface water (GWUDI). CWSs should have notified the Division prior to beginning any construction which is under the system's control and prior to start-up. "System control" means the system is funding the project and has signed a contract for its construction or is constructing the project in-house. If a project is underway during the inspection, the inspector can check for the presence of approved plans on-site. The inspector should check the system carefully for construction projects, and then see if there is the documentation. If a line extension has been completed the system should have the results from the bacteriological examination of the new pipe or reservoir conducted by a **state certified** bacteriological lab. In addition, it may be helpful to review the system's Emergency Operations Plan (EOP) for consistency with essential equipment, storage tanks, and other facilities that should be inspected. Also, the last distribution map sent to the Division of Water Supply should be reviewed to see if water service is being expanded to developing areas (new subdivisions, etc.). The distribution map must be no older than 5 years. Inspectors should be attentive to areas with hydrants, meters, etc. that are not shown on the system's current distribution map.

(D) **Enforcement**

System Category		
CWS (Community Water System)	**NTNCWS (Non-Transient Non-Community Water System**	**TNCWS (Non-Transient Non-Community Water System**

If Notices of Violation (NOVs) or Notices of Noncompliance (NONCs) are present in the file indicating violation of primary monitoring requirements or primary standards, then the

inspector should look for evidence of public notification. If a system is currently under enforcement, then the inspector should contact the Division's Enforcement Coordinator to determine the status of the case and the best time for the system to be inspected. It may be desirable to coordinate a sanitary survey with a enforcement compliance schedule or to further document a situation pending enforcement. Under no circumstances should a sanitary survey be postponed if it causes the system to incur a violation. If serious or potential health threatening violations are found during the survey, or numerous minor violations are found, the inspection becomes more formal and a Notice of Non-Compliance (NONC) must be issued and a Compliance Review Meeting (CRM) scheduled or held at that time. Normally, however, non-health threatening violations identified through a sanitary survey are not addressed by formal enforcement action.

(E) **Bacteriological Results**

System Category

CWS (Community Water System)	NTNCWS (Non-Transient Non-Community Water System	TNCWS (Non-Transient Non-Community Water System

Results from the bacteriological analyses for the system should be checked to assure adequate sampling was performed. Sampling should correspond to the system's Bacteriological Sampling Plan (Section 1.J.). Any positive distribution or repeat sample must be followed by at least four repeat samples (if the system is required to take one (1) routine sample per month); and three repeat samples if the system takes more than one routine sample each month. The repeat samples must be taken within 24 hours of being notified of the positive result. Repeat sampling must continue until all repeat samples are negative or the system exceeds the Bacteriological Maximum Contaminant Level (MCL). Any system collecting 1-39 samples per sampling period can have no more than one positive (showing the presence of coliform) sample. Systems collecting 40 samples or more per sampling period can have no greater than 5% of the samples positive. Negative repeat samples do not eliminate the required "elevated" (additional) routine samples the following month. If a smaller system has a positive sample result which is suspected to be the result of questionable sampling technique, the system should be reminded of the procedure for sample invalidation contained in Rule 1200-5-1-.07(3). Quality assurance samples are considered the same as a routine distribution system sample and are treated as such.

(F) **Turbidity/Treatment Technique Compliance**

Source

Surface Water	True Ground Water (no filter)	True Ground Water (Iron/Manganese Filter Removal)	Ground Water Under the Influence of Surface Water (Avoiding Filtration)	Ground Water Under the Influence of Surface Water (Filtration)	

(excludes True ground water sources with approved sand and gravel formations)

The second major compliance item is turbidity. Public water systems having a true ground water source are not required to monitor for turbidity. Sources determined to be true ground water are considered to be in approved sand and gravel formations (Rule 1200-5-1-.05(11)).

Turbidity compliance for **public water systems with a ground water source** which is not an approved sand and gravel formation and serving over 50 connections or 150 people must have turbidity monitoring equipment and a recording unit.

Subpart H systems (surface water systems and ground water systems under the direct influence of surface water) meeting the criteria for avoiding filtration must comply with the 5 NTU maximum (no single sample can exceed this value) (See Rule 1200-5-1-31(2)).

Subpart H systems with conventional, diatomaceous earth or direct filtration that are required to monitor turbidity must take measurements every four hours (within a twenty-four hour period a system must have 6 measurements). Measurements may be more frequent than every four hours. According to DWS procedure (13 May 1993) water systems that elect to take more than one turbidity sample during one of the six time segments are required to **report the highest detected turbidity** determined during the four hour segment. Systems with slow sand filtration or filtration treatment other than conventional treatment and systems serving fewer than 500 persons regardless of the type of filtration used may reduce the sampling frequency to one per day if less frequent monitoring is sufficient to indicate effective filtration performance.

Until January 2005 Subpart H systems (surface water systems and ground water systems under the direct influence of surface water with filtration) serving fewer than 10,000 persons, must comply with the 0.5 NTU maximum in 95 percent of all combined filter effluent samples taken during the period (See Rule 1200-5-1-.31(2) and (4)) and 5 NTU (no samples can exceed this maximum).

Subpart H systems (after January 1, 2002) serving 10,000 or more persons, SDWIS verifies system adherence to the 1.0 NTU maximum (combined filter effluent) and a maximum of 0.3 NTU in 95 percent of all combined filter effluent samples collected each month. Also, systems must monitor individual filters. Individual filter turbidity levels cannot exceed 1.0 NTU in two consecutive measurements taken 15 minutes apart; nor can individual filters exceed 0.5 NTU in two consecutive measurements taken 15 minutes apart at the end of the first four hours of operation after a backwash; nor can individual filter turbidity levels exceed 1.0 NTU in two consecutive measurements taken 15 minutes apart in three consecutive months; nor can individual filters exceed 1.0 NTU in two consecutive measurements 15 minutes apart in two consecutive months. If an individual filter exceeds any of the above limits, a filter profile and special report to the state is required. A turbidity level above 2.0 NTU requires a comprehensive performance evaluation (CPE) to be performed by an outside consultant.

Subpart H systems (after January 14, 2005) serving fewer than 10,000 persons, SDWIS will verify system adherence to the 1.0 NTU maximum (combined filter effluent) and a maximum of 0.3 NTU in 95 percent of all combined filter effluent samples collected each month. Also, systems must monitor individual filters. Individual filter turbidity levels cannot exceed 1.0 NTU in two consecutive measurements taken 15 minutes apart; nor can individual filters exceed 0.5 NTU in two consecutive measurements taken 15 minutes apart at the end of the first four hours of operation after a backwash; nor can individual

filter turbidity levels exceed 1.0 NTU in two consecutive measurements taken 15 minutes apart in three consecutive months; nor can individual filters exceed 1.0 NTU in two consecutive measurements 15 minutes apart in two consecutive months. If an individual filter exceeds any of the above limits, a filter profile and special report to the state is required. A turbidity level above 2.0 NTU requires a comprehensive performance evaluation (CPE) by an outside consultant. Systems must document that if an individual filter effluent exceeded the action level, a filter profile and/or obvious cause of the exceedance has been produced.

Notice of Violation (NOVs) letters regarding lack of monitoring or exceedances of the combined filter effluent of either of the two turbidity standards should be found in the correspondence file.

(G) **Disinfection/Disinfection By-Products Compliance**

Source					
Surface Water	**True Ground Water**	**True Ground Water (Iron/Manga-nese Filter Removal)**	**Ground Water Under the Influence of Surface Water (Avoiding Filtration)**	**Ground Water Under the Influence of Surface Water (Filtration)**	**Purchase**

All community water systems using groundwater as a raw water source and serving more than 50 connections or 150 persons shall continuously chlorinate (unless another disinfection method has been approved). Public water systems using surface water shall continuously chlorinate. All public water systems serving 50 or fewer connections that do not disinfect shall install continuous disinfection if the system fails to comply with the Maximum Contaminant Level (MCL) for coliform, etc. (See Rule 1200-5-1-.17(4).)

Disinfection compliance is generally determined using SDWIS data submitted on the “Disinfection Summary Form” and the “Monthly Operation Report” (MOR). Systems are required to determine and report a chlorine residual with each bacteriological sample collected. Surface water and ground water under the influence systems are required to monitor chlorine continuously unless they meet certain population requirements (i.e. they serve less than 3300 people) that could qualify them for less than continuous monitoring.

In addition, Subpart H public water systems serving 10,000 or more persons must monitor for HAA5 and THMs or have conducted disinfection profiles. If HAA5 or TTHM results are above 0.048 mg/L and 0.064 mg/L respectively, the system must have a disinfection profile to comply with the disinfection and filtration rule (see 1200-5-1-.31(8) and .36(2)). Systems that do not monitor for HAA5 and TTHM must conduct disinfection profiling.

By January 1, 2004 Subpart H public water systems serving fewer than 10,000 persons and systems using only ground water not under the influence of surface water must monitor for HAA5 and THMs or have conducted disinfection profiles. If HAA5 and TTHM results have not been kept, the system must have a disinfection profile to comply with the disinfection and filtration rule (see 1200-5-1-.36(2)).

The sanitary survey should also review whether a parent water system takes into account the distribution system of any **consecutive systems** served when determining the maximum residual contact time sample and sampling sites. Because of the need to protect the public health of all users on water systems serving 10,000 or more persons, parent systems selling water to a consecutive system must take into account the distribution system of consecutive systems when determining sample locations and preparing their monitoring plan. If test results show a problem that is determined to be caused by the failure of the consecutive system to properly operate and maintain its distribution system, steps will be taken to require the consecutive system to develop its own monitoring plan and begin monitoring for TTHMs and HAA5. The parent system should be required to adjust its monitoring plan accordingly.

Consecutive systems that are a part of a Subpart H system complex that purchase water from more than one system are required to establish an individual monitoring plan and sample for TTHMs and HAA5. The number of samples required for the consecutive system will be based on the population served by the consecutive system in accordance with the regulations.

Consecutive systems that are determined to cause high values of TTHMs and/or HAA5 for the parent system due to improper design, operation and/or maintenance of the distribution system will be required to develop an individual monitoring plan for TTHMs and HAA5. The number of samples required will be based on the population served by the consecutive system in accordance with the regulations.

(H) **Chemical Analyses**

System Category		
CWS (Community Water System)	**NTNCWS (Non-Transient Non-Community Water System**	**TNCWS (Non-Transient Non-Community Water System**

The next major area for review should be chemical analysis. The files should be checked to see if analyses were performed according to the **Standard Monitoring Framework** or waivers issued as required by rules. All monitoring must have been by a certified laboratory. Results may be scanned to insure that a violation of any of the standards has been noted and the system is meeting sampling requirements. Included in the chemical parameters are the chemical groups consisting of **inorganics** (including arsenic), **synthetic organic chemicals** (regulated and unregulated), **volatile organic chemicals** (regulated and unregulated), **radionuclides** (including uranium), **sodium**, **disinfection by-products** and **lead** and **copper**. **Radon** and other chemicals will also be checked after rules are adopted which require monitoring for them.

The Standard Monitoring Framework requires that inorganic chemical samples (antimony, asbestos, barium, beryllium, cadmium, chromium, cyanide, mercury, nickel, nitrate, nitrite, selenium and thallium) be taken by groundwater systems at every entry point to their distribution system every compliance period (three year period) and surface water system and combined surface/groundwater systems annually (Rule 1200-5-1-.09(7)). Decreased monitoring may be specified provided certain criteria are met. **(NOTE: Transient non-community water systems (TNCWSs) are not specifically excluded**

from the monitoring requirements of Rule 1200-5-1-.09, however Maximum Contaminant Levels (MCLs) do not apply per Rule 1200-5-1-.06(1).)

Nitrate samples must be taken by community and non-transient non-community water systems (PWSs) served by ground water annually. Nitrate samples must be taken by community and non-transient non-community water systems (PWSs) served by surface water quarterly for at least one year and following any sample greater than or equal to 50 percent of the MCL. Otherwise ground water systems may be allowed to sample after the initial year on an annual basis. Nitrate samples must be taken by **transient non-community water systems** annually (Rule 1200-5-1-.09(8)).

A **Nitrite** sample must be taken by every public water system (PWS). After the initial sample, systems with a concentration greater than or equal to 50 percent of the MCL shall monitor quarterly and then annually if four consecutive quarters are less than the MCL.

Arsenic samples must be taken at each entry point of all community and non-transient non-community water systems utilizing surface water sources at yearly intervals and by ground water systems at three year intervals. Samples must be taken by community and non-transient non-community water systems utilizing surface water sources at yearly intervals (Rule 1200-5-1-.09(6)). The proposed revised arsenic rule requires surface water systems to complete initial monitoring by December 31, 2006 and groundwater systems by December 31, 2007. Under the proposed rule, states may grant a 9-year monitoring wavier to a system. Criteria to be considered includes previous monitoring data, variations in reported concentrations, stream characteristics, etc. One sample must be taken during each 9-year compliance cycle. Composting of samples is allowed.

Asbestos samples must be taken by community and non-transient non-community water systems during the first three-year compliance period of each nine-year compliance cycle. Water systems may be waived from monitoring if they are not exposed to asbestos-cement pipes or contamination in its source water (Rule 1200-5-1-.09(8)).

Organic Chemicals (Regulated organic chemicals are listed in Rule 1200-5-1-.06(2)) must be monitored by community and non-transient non-community water systems over four consecutive quarters each compliance period (three-year period) according to Rule 1200-5-1-.10(1)(d). Systems serving more than 3300 people that do not detect a contaminant in the initial compliance period may reduce sampling to two quarterly samples in one year during each repeat compliance period. Systems serving 3300 or less may reduce sampling to one sample. Systems may apply for a waiver each compliance period. Waivers may be granted based on use/potential sources within the watershed.

Unregulated Organic and Inorganic Chemicals is also known as “Unregulated Contaminant Monitoring Rule” or “UCMR,” and is listed in Rule 1200-5-1-.28(10). In addition, all public water systems serving 10,000 or more persons must conduct URCM in accordance with the EPA schedule. Unregulated Organics must be monitored by all community and non-transient non-community water systems. Surface water systems must take four quarterly samples (the exception being sulfate, which requires only one sample) per water source and ground water systems must sample at points of entry to the system representative of each well. Monitoring is conducted only once for the contaminants listed in .28(10)(a). Composite samples from a maximum of five sampling

points are allowed and the state may grant a waiver based on criteria specified in the rules.

Volatile Organic Chemicals must be monitored by community and non-transient non-community water systems at each entry point to the distribution system representative of each well or entry point representative of each surface source or entry point to the distribution after treatment. Regulated VOCs which are listed in Rule 1200-5-1-.25(2) must meet established MCLs. Unregulated VOCs, listed in Rule 1200-5-1-.28(5)), do not have to meet an MCL. After the initial compliance period (three years) sampling for regulated VOCs groundwater systems (which have no detections in any sample per Rule 1200-5-1-.26(f)) must take one set of samples each compliance period (three-year period). Surface water systems must monitor annually. Monitoring requirements for ground water and surface water systems with any parameter exceeding .0005 mg/l must monitor more frequently (see Rule 1200-5-1-.26(g)). Systems which violate the MCL for any regulated VOC must monitor quarterly at each sampling point with a detection. Unregulated VOC monitoring is to be repeated by CWSs and NTNCWs serving more than 10,000 persons every 5 years (Rule 1200-5-1-28(1) and (8)), otherwise monitoring is conducted only once for the contaminants listed in .28(5). Compositing of samples is allowed in some instances. Finally, waivers may be issued after initial monitoring where parameters are not detected and there is no use/storage/spill history of the parameter within the watershed. Waivers are effective for no more than two compliance periods (6 years).

Lead and Copper monitoring applies to community and non-transient non-community water systems (Rule 1200-5-1-.33). The number of samples required by a system depend on system size (Table 1200-5-1-.33(7)(c)). Monitoring must be conducted within six-month periods with provisions for reduced monitoring to one sampling event per year (June through September) based on meeting certain criteria. Systems deemed to have optimized corrosion control treatment must continue to consistently meet water quality parameters and notify the DWS if there is a change in treatment or water source.

The **Disinfection by-Products** Rule was adopted by the WQCB December 16, 1998. The rule (1200-5-1-.36) applies to **all** community and non-transient non-community water systems. Subpart H systems serving 10,000 or more persons must begin monitoring no later than January 1, 2002. All remaining systems must being monitoring by January 1, 2004. Systems must prepare monitoring plans which identify applicable parameters (TTHMs, HAA5, TOCs, chlorine, chloramines, chlorine dioxide, etc.) and describe locations and schedules for collecting samples. For example, use of ozone requires systems to monitor treated water for bromate on a monthly basis. If approved by the DWS, systems may use existing data to comply with the disinfection by-product monitoring or profiling required by this rule.

Sodium samples must be taken by community water systems using a surface water source annually. One sample per treatment plant must be taken at the entry point to the distribution system. Sodium samples must be taken by community water systems using ground water sources every three years. One sample must be taken per treatment plant and/or aquifer. See Rule 1200-5-1-.24.

Trihalomethane monitoring (bromodichloromethane, dibromochloromethane, tribromomethane aka bromoform, and trichloromethane aka chloroform) applies to community water systems serving 10,000 or more people that add a disinfectant. Trihalomethane monitoring must be conducted quarterly. Samples must be taken from representative locations in the distribution system with 25 percent of the samples

reflecting maximum residence time in the distribution system. Provisions allow for reduced monitoring based on source type and concentrations found. Trihalomethane monitoring, as provided for in Rules 1200-5-1-.22 and .23 will no longer apply after December 31, 2003. Refer to Rule 1200-5-1-.36.

Community water systems must conduct quarterly **radionuclide** sampling for gross alpha particle activity, radium-226 and radium-228 and uranium once every three years or once every six or nine years dependent on meeting criteria specified in the rule. If the average of the monitoring results for each contaminant is below the detection limit the system can reduce monitoring for that contaminant at that sampling point to every nine years. Similarly, a system may reduce monitoring to every six years if contaminants are at or below ½ the MCL.

(l) **Public Notification**

System Category

CWS (Community Water System)	NTNCWS (Non-Transient Non-Community Water System	TNCWS (Non-Transient Non-Community Water System

Acute violations and situations with significant potential to have serious adverse effects on human health as a result of short-term exposure are "**Tier 1**" violations and require an immediate notice be given to customers. Acute violations include exceeding the MCL for fecal coliform, e-coli, nitrate, chlorine dioxide, a treatment technique requirement or turbidity MCL where the department determines a Tier 1 notice is required or a disease outbreak has occured. Turbidity and treatment technique requirement violations may also be considered Tier 1 violations where the Department is not consulted within 24 hours. The Notice must be given within 24 hours of the system learning of the violation using the broadcast media, posting, hand delivery or other method approved by the Department, calculated to reach all persons served by the system.

Non-acute violations and situations with potential to have serious adverse effects on human health are categorized a "**Tier 2**" violations and require that CWSs and NTNCWSs provide direct mail notice to each customer in addition to providing notice to persons that would otherwise not receive a mailing. Non-acute violations include MCL, MRDL, turbidity and treatment technique requirement violations. The notice requirement to individuals not receiving direct mail, including those served by TNCWSs can be met by radio announcements, posting entrances to factories and apartments and/or providing newspaper announcements. Tier 2 violations require public notices to be given within 30 days after the system learns of the violation.

Violations and situations not included in Tier 1 or Tier 2 are categorized as "**Tier 3**" Tier 3 violations include monitoring violations, failure to comply with a testing procedure, provide monitoring results as required, etc. Tier 3 violations require public notice to be given by mail or other direct delivery to each customer receiving a bill within one year after the system learns of the violation. CWSs are not required to give direct public notice if the violation and other required language is included in its Consumer Confidence Report (CCR). NCWSs may use any method calculated to reach other persons served by the system, including newspaper, postings, newsletter and e-mail.

The water system is required to provide the Division with a copy of the notification given to the public within 10 days after publication. System files should contain a copy of any required notification. Details of public notification requirements can be found in Rule 1200-5-1-.19.

(J) **Consumer Confidence Reports (CCRs)**

System Category

CWS (Community Water System)		

In 1998, EPA promulgated the Consumer Confidence Report Rule requiring community water systems to issue annual water quality reports to their customers. CCRs are due each year by July 1 and may include the public notice for Tier 3 violations. Tier 3 violations must be made public within 12 months of occurrence, meaning the CCR might have to be published before July 1. CCRs provide a snapshot of water quality over the preceding calendar year. The reports must include information on levels of detected contaminants and if the system has violated an MCL or a treatment technique or had monitoring or reporting violations. The report must also include information on the potential health effects of contaminants.

CWSs must provide an annual CCR in a timely manner. CCR data must be given to consecutive systems by April 1 annually unless an alternative date has been mutually agreed upon. The first report, for the calendar year 1998, had to be delivered by October 19, 1999, and in subsequent years by July 1 thereafter. Details concerning the Consumer Confidence Report can be found in Rule 1200-5-1-.35.

Since the initial Consumer Confidence Reports, CCR requirements have been modified to address the IESWTR, D/DBP, Radionuclide, Public Notice and Arsenic Rules. In the foreseeable future, CCRs may be required to include information relative to the Ground Water Rule (GWR), Radon, Long Term 1 Enhanced Surface Water Treatment Rule (LT1ESWTR), and Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR).

(K) **Operator Certification**

System Category

CWS (Community Water System)	NTNCWS (Non-Transient Non-Community Water System	TNCWS (Non-Transient Non-Community Water System

The inspector should check to see that the system currently meets the requirements of operator certification under the Water Environmental Health Act (WEHA). (See TCA 68-221-904 and Rule 1200-5-1-.17(1).) The act requires all public water systems (meeting the Tennessee SDWA definition of CWS, NTNCWS and most TNCWSs) to have a certified operator in direct charge. Excluded from the requirement are transient non-community water systems which do not serve water 60 consecutive days or 120 days during the year. The exclusion primary affects rural churches meeting only on Sundays

with few if any weddings, funerals or other functions and seasonal camps which are open less than two total months during the year.

WEHA regulations adopted July 5, 1998 by the Operator Certification Board classify water treatment systems and distribution systems according to the level of certification required. The classifications are as follows:

Small Water System: Water systems which have a true ground water source not under the direct influence of surface water and serve less than fifty (50) service connections and those small systems which purchase water for resale and serve less than fifty (50) service connections. This classification also serves as a distribution system certification for public water systems meeting the definition of a small water system. Generally, the only treatment provided by such a system is chlorination and/or fluoridation. Water systems which treat water to control for corrosion, etc. will be classified as Water Treatment I-IV depending on the complexity of the treatment processes employed. **Public water systems which utilize NSF approved (1 mircon) cartridge systems will not be assigned points.**

Water Treatment I-IV: Water systems which have a water treatment plant using filtration and/or lime-soda softening processes or requiring chemical or bacteriological control of operation are classified in accordance with a point system:

Grade IV - 61 or more points
Grade III - 35 to 60 points
Grade II - 16 to 34 points
Grade I - 15 or less points

The rating value points are given in the Water Environmental Health Act (WEHA) Rules. The inspector should be prepared to compare listed treatment processes with what the system has in-place on the day of the inspection. Placing into service facilities and treatment processes which have not been approved merit enforcement.

Grade I Distribution: water distribution systems serving between 50 and 5,000 service connections; systems serving less than 50 connections are not required to have a certified distribution operator.

Grade II Distribution: water distribution systems serving more than 5,000 service connections.

System compliance with operator certification requirements can be determined by checking the printout of certified operators (distributed quarterly by the data management section of the DWS). Printouts are sorted by facility and by operator name. Water systems are required to notify the Certification Board in writing of the loss of certified operators so that the DWS can identify those facilities with and without a certified operator. The Certification Board has authorized the DWS to receive the notification on behalf of the Board. Inspectors should also verify the accuracy of the information during the inspection.

Note that the Water Environmental Health Act (WEHA) requires all public water systems that serve water at least 120 days or 60 consecutive days out of the year to have the person in direct charge to be certified. Persons in direct charge shall mean the person or persons, expressly designated to be in direct charge and named in writing to the certification board and the Division of Water Supply by the water supply system. All

operating personnel making process control/system integrity decisions about quality or quantity that affect public health must be certified. A designated certified operator must be **available** for each operating shift. The person in direct charge of the treatment facility and distribution system must have the appropriate certification in accordance with the classification system of the Board of Certification. A system that has an operator who is certified but has not been designated as in direct charge will not be given credit for meeting the certification requirements. The state must be notified when an operator is designated as "in direct charge."

A system that replaces the certified operator within 30 days of the loss or that has been granted an extension of time by the Board to replace the certified operator will not be assessed a penalty. A system can have the certified operator penalty reduced if system officials sign a Letter of Agreement (LOA) if signed within 30 days of the loss specifying a date within 30 days for the replacement operator. The LOA should also address any other major deficiencies of the system. If the signed LOA is acceptable to the Division, then the penalty can be reduced. If the operators have changed since the last inspection, is there corresponding documentation, i.e. notification to the Fleming Training Center (FTC), Nashville Central Office (NCO) or Environmental Assistance Center (EAC).

Standard Operating Procedures (SOPs): The inspector conducting the Sanitary Survey should also review whether the water system meets the new requirements of the EPA as to the "availability" of a certified operator in direct charge. To comply with the requirements the DWS issued Guidance to public water systems on Preparing Standard Operating Procedures (SOPs) on November 8, 2001. Tennessee now requires that all operating personnel making process control/system integrity decisions about water quality or quantity that affects public health must be certified. Further, it is the Tennessee Operator Certification Board's policy that if a certified operator has prepared **standard operating procedures** describing his decisions regarding process control/system integrity about water quality and quantity produced and distributed, then he is "available" as long as the SOP is followed.

To comply with state and federal laws and policies, public water systems should prepare standard operation policies and procedures if they do not have a certified operator on duty each shift the plant operates. Further, the operator in direct charge should have written policies in place to protect him from enforcement action should his policies not be followed by an operator running the plant in the certified operator in direct charge's absence.

The SOP should task the operator in direct charge of the plant and distribution system, shift operators and other operating staff having the basic skills, judgement, and care needed to operate a treatment plant in the manner in which it is capable for the production of drinking water. To be effective, SOPs must be specific with respect to the duties of operating personnel.

The SOP should also delineate the responsibilities and duties of water system management. Superintendents, mayors and where applicable commissioners, should be tasked with familiarizing themselves with water treatment plant operator certification laws and regulations. They should also have a working understanding of drinking water standards and critical water quality indicators.

(L) **Cross Connection Plan and Program**

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System Category		
CWS (Community Water System)		

All community water systems are required to have an approved ordinance or policy and plan prohibiting cross connections as well as have an active on-going program to detect and eliminate cross connections as approved by the Division. (See Rule 1200-5-1-.17(6).) Additionally, a copy of the approved cross connection ordinances/policies and plans should be contained in the EAC files. Customer records should be checked to determine if full-time customers have low or no water usage at time. These items should be checked prior to the inspection.

The cross connection plan should identify how it will identify potential cross connections and detail a plan of annual inspections and testing of back-flow prevention devices. The plan must specifically require individuals who test devices **be certified** (individuals with a plumber's certificate are not acceptable testors). The plan must specifically target homes with water wells, swimming pools, irrigation systems, and businesses and categorize hazards as to "high" and low hazard potential. Also, the cross connection plan should specify educational materials available for distribution and use. Water systems should review cross connection plans, their education efforts and inspection programs and periodically update their materials and program.

(M) **Emergency Operations Plan (EOP) and Distribution Map**

System Category		
CWS (Community Water System)		

Every community water system is required to have an Emergency Operations Plan (EOP) which outlines the actions that should be taken during a disruptive event which affects the quantity or quality of water served by a system. (See Rules 1200-5-1-..17(7) and 1200-5-1-.16(1).) The Emergency Operations Plan should be formulated after an assessment of how an emergency would affect the system's resources such as water source, treatment facilities, distribution system, and employees. The Emergency Operations Plan addresses such issues as personnel assignments during an emergency event, communication procedures, location of supplies, equipment location and availability, mutual aid availability such as suppliers, contractors, other water systems, etc., and water use priorities following the emergency. The inspector should stress the importance of completing and submitting an Emergency Operations Plan to those systems lacking an approved plan. Approved plans should be checked to see that they are accurate and up to date. The distribution map should also be up to-date. Were any circumstances (water outages to areas of the systems exceeding 12 hours, chemical spills, equipment failures, etc.) encountered by the system since the last survey which would have necessitated reliance on the Emergency Operations Plan (EOP)? Did the system rely on the EOP? Determine if the distribution map has been updated and if the EOP reflects these situations? Any significant changes should be submitted in an update, addendum

or insert to the Emergency Operations Plan (EOP). This plan should be reviewed and updated if needed every two years or every time there is a change in chain of command.

(N) **Wellhead Protection Plan (WHP)**

	Source				
	True Ground Water (no filter)	True Ground Water (Iron / Manganese Filter Removal)	Ground Water Under the Influence of Surface Water (Avoiding Filtration)	Ground Water Under the Influence of Surface Water (Filtration)	

All public water systems using a ground water source shall prepare a Wellhead Protection Plan (WHP) which determines a wellhead protection area and identifies all potential sources of contaminants (septic tanks, underground fuel storage tanks, cemeteries, sinkholes, abandoned wells, etc.) which may have an adverse effect on the health of persons and potential contaminant sources within the area. A Wellhead Protection Plan should be available for review during the survey. Each ground water system will be required to have a Wellhead Protection (WHP) plan according to the categories listed in Rule 1200-5-1-.34(1)(e). Wellhead Protection Plans are revised every three years or when changes warrant.

(O) **Fluoridation**

	System Category	
CWS (Community Water System)		

The inspector should check some additional items for those systems which fluoridate. Fluoridated systems are required to submit quarterly check samples to a State certified laboratory to insure the accuracy of local monitoring. Failure to submit the necessary check samples should be cited in the survey letter. A printout is distributed quarterly containing the results of the check samples as well as results from any random fluoride samples taken by Division personnel. Systems are required to monitor fluoride as follows: surface-water systems should check finished water daily and distribution water daily excluding holidays; ground water systems should check distribution system water daily, if possible. Surface raw water should be checked one to two times per month or whenever a water quality change is anticipated or detected. The recommended range for fluoride concentration is 0.9 - 1.3 mg/L. Systems should be encouraged to maintain the fluoride concentration to at least 1.0 mg/L to maximize the dental benefits of fluoridation. Monthly Operating Reports (MORs) can be checked to see that proper monitoring is performed, quantity of chemical fed is recorded, and dosage is calculated and recorded. This should be done daily. If questions arise concerning the status of fluoridation for a system or the need to assess penalty points, the inspector is encouraged to contact the fluoridation personnel in the Nashville Central Office.

(P) **Monthly Operation Reports (MORs)**

System Category

CWS (Community Water System)		

or

Source

Surface Water	**True Ground Water (no filter)**	**True Ground Water (Iron/Manganese Filter Removal)**	**Ground Water Under the Influence of Surface Water (Avoiding Filtration)**	**Ground Water Under the Influence of Surface Water (Filtration)**	

All community water systems **and** non-community water systems with a "surface source" are required to submit Monthly Operating Reports (MORs) to their respective EAC. (See Rule 1200-5-1-.17(2).) Distribution systems should list daily the amount of water purchased, daily chlorine residual, and location of bacteriological sampling. Systems producing their own water should report the parameters listed on their laboratory monitoring program (Appendix 2) at the frequency indicated in their monitoring schedule. Operators should utilize standard methods when conducting tests. Systems should report the amount of each chemical fed (without regard to concentration or purity) and the calculated dosage along with information on concentration, etc. The inspector should check to see if all MORs have been submitted and received on time (by the tenth of the following month). The inspector should take the MORs from the twelve month period preceding the survey and calculate the average daily demand and find the maximum daily demand. Missing data, and unrealistic patterns of data should be noted and their cause ascertained. Computer generated monthly operation forms may be submitted with prior approval by the EAC. Inspector should make sure the operational tests include sufficient "in process," or "unit performances" tests. If sufficient tests are not being done, they should be specified in the monitoring program.

Penalties may be assessed for violations of **secondary standards** (Rule 1200-5-1-.12) which are reported on Monthly Operating Reports (MORs). These should be taken into consideration if there have been complaints that can be attributed to the violation. Analytical monitoring errors should be excluded. If the monthly average for iron or manganese exceeds the standard or if the pH is out of range for 10 or more days during the month, then a penalty may be assessed under Section III.C., Secondary Chemicals.

Failure to monitor for the required parameters may be penalized under Section II B., Laboratory Process Monitoring. Failure to fully complete and sign all the MORs as required may be penalized under Section II. D., Submission of Monthly Operating Reports.

If the laboratory monitoring program needs updating then this should be done by the inspector at the time of the survey using the criteria developed by the Division. A copy of the monitoring criteria is contained in the appendix.

(Q) **Corrosion control**

System Category		
CWS (Community Water System)	**NTNCWS (Non-Transient Non-Community Water System**	

All water systems must minimize lead and copper concentrations at the user's tap. (See Rule 1200-5-1-.04(53) and .33(1)(a) and (d).) All water systems must provide an optimal corrosion control treatment program (OCCTP). MORs and benchsheets should verify that the treatment program continues to be followed as approved.

A system will not be assessed deficiencies if it uses an inhibitor that proves to be effective or has documentation through the use of coupons or other means that the water is not aggressive to the materials used in the distribution system.

(R) **Bacteriological Sampling Site Plan**

System Category		
CWS (Community Water System)	**NTNCWS (Non-Transient Non-Community Water System**	**TNCWS (Non-Transient Non-Community Water System**

The Sanitary Survey should also review the adequacy of the water system's bacteriological sampling plan to create sampling zones and identify sites within those zones which are representative of water throughout the distribution system and insure that no portion of the distribution system has been neglected. (See Rule 1200-5-1-.07.) The plan insures that bacteriological samples are collected at sites that are representative of the water throughout the distribution system, including dead-end lines, low use areas, residential areas, and near storage tanks. Following the plan allows the system to identify potential cross connections, and other hazards.

The sampling plan should include division and laboratory contact information, number of and schedule for samples to be taken each month, a sampling log and information on record keeping, sampling procedures, timeframes and actions to be taken in response to total positive and fecal positive samples, etc.

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(S) **Flushing Program Plan**

System Category		
CWS (Community Water System)	**NTNCWS (Non-Transient Non-Community Water System**	

Community water systems and non-transient non-community water systems must have flushing program plans to address potential biofilm growth, HAA5 and TTHM formation, sediment, taste and odor problems and low disinfectant residuals. (See Rule 1200-5-1-.17(10) and (23).) Flushing plans must specify disinfection and flushing requirements necessary after water main repairs when the line is partially or completely de-water. Actual flushing records (containing information on the date, time, location, chlorine residual, etc.) are to be reviewed during the on-site inspection. In addition, sites with air relief valves, blow-offs and other needed equipment should be identified so they can be verified as properly maintained.

(T) **Capacity Development Plan**

System Category		
CWS (Community Water System)	**NTNCWS (Non-Transient Non-Community Water System**	**TNCWS (Non-Transient Non-Community Water System**

All public water systems are subject to the Capacity Development Plan Requirement. All **new** CWSs and NTNCWSs must have a Capacity Development Plan and be a viable system. Existing water systems identified as not complying or potentially not complying (see Capacity Development Strategy) must prepare a Capacity Development Plan. A Capacity Development Plan includes information concerning organizational structure, fiscal management and controls, staffing and a Business Plan identifying sources of income and costs related to operating a water system. According the DWS's "Capacity Development Strategy," **all existing** water systems which have become "SNCs" or are a potential SNC are required to develop a Capacity Development Plan. (See Rules 1200-5-1-.04(3), (4), (84) and 1200-5-1-17(37) and (38).)

(U) **Filter Backwash Recycling**

Source					
Surface Water				**Ground Water Under the Influence of Surface Water (Filtration)**	

By December 8, 2003, systems that recycle spent filter backwash water, thickener supernatant, or liquids from dewatering processes, must notify the State in writing that they practice recycling. This notification must include the following:

1. A plant schematic showing the origin of all recycle streams including the hydraulic conveyance used to transport the recycled flows and the location where they are recycled back into the plant;

2. The typical recycle flow (in gpm);

3. The highest observed plant flow experienced in the previous year (in gpm);

4. The water treatment plant design flow (in gpm); and

5. The State approved operating capacity for the plant (if the State has made that determination).

Additional information including treatment or equalization of the recycle stream, operational practices such as when the recycle stream is introduced into the main line (e.g., during minimum plant flow), changes in main treatment process to accommodate for recycle flows such as increased chemical addition and any other pertinent information regarding recycle streams may also be submitted with the required information to assist States in understanding the affects recycle streams have on individual systems.

II. Conducting the Inspection

(A) Records Investigation

System Category

CWS (Community Water System)	NTNCWS (Non-Transient Non-Community Water System	TNCWS (Non-Transient Non-Community Water System

The inspection should probably begin at the office of the water system. Not only is this the most appropriate time to verify/obtain property owner information, but it is a good time to verify data and the classification of the system. Under the Safe Drinking Water program the **property owner** is clearly the responsible party, whether it is a municipality, corporation, or individual owner who is leasing a facility to a business operator. Though a tenant may have an agreement whereby the tenant pays various taxes, fees and operates the facility, the property owner is ultimately responsible for the system. It is acceptable for the tenant to operate the water system, but if they do not the system owner (property owner) is the “supplier of water” under the act. In addition, it is imperative to verify/obtain information regarding those who manage and operate the public water system, including certified operators, those in direct charge, current mailing addresses, phone numbers, location data, etc. **Any documents required by the DWS (cross connections policy, operator agreements, wellhead protection plans, etc.) must be signed by the owner, registered agent, or other individuals with the clear legal authority to represent the owner.** The system data sheet can be modified at this time incorporating any changes that may have occurred since the last inspection.

Circumstances which may warrant advance notice prior to conducting the inspection, including water systems which are likely to be closed to inspectors should the inspection be unannounced (small, rural churches, etc.).

The office will likely be the location where some files are kept. Other records will be maintained at the water treatment plant. The inspector should determine the location of the records needed for review and check to see that the system has maintained adequate records. The following records are required to be maintained and available for review for the specified period of time.

Microbiological results (Including line repair samples)	5 years
Chemical analyses	10 years
Sanitary Surveys or other reports	10 years
Action taken regarding violations	3 years
Public Notification	3 Years
Notification of Construction	survey to survey
Flushing Records	survey to survey
New Tap Records	survey to survey
Turbidity results (Including dated recording charts, etc.)	3 years or survey to survey (longest)
Records of variance and exemption	5 years
Daily worksheet, shift logs and MORs	survey to survey
Cross connection records	5 years
Complaint Logs	5 years
Maintenance and Service Records (Including repairs of vandalism, break-ins, and system flushing)	5 years
Storage tank inspections	life of tank
Consumer Confidence Reports	3 years
Equipment Calibration Records	survey to survey
Disinfection Profiles	
Filter Profiles	
Chemical Wavier Letters	

The system should also maintain records involving public notification resulting from violating the primary drinking water requirements.

Records from the system's ongoing cross connection program may be accessed at this time. Documentation should be available regarding cross connection surveys (number of inspections, dates, locations, and other details, etc.), re-surveys, enforcement, and testing. Details regarding evaluation of the cross connection program may be found in the Rating Guidance package (p. 20).

Records must be available for routine flushing in the distribution system. Flushing records should detail location, date, employee, and initial and ending chlorine residual. Records should also indicate purpose of flushing, i.e. maintaining chlorine residuals, flushing of repaired lines, response to taste and odor complaint, and other.

The map of the distribution system must be made available to DWS personnel. A continuously updated overall map (not construction plans and not necessarily on a single sheet) with addendum or inserts, etc. must be submitted to the Division every five years.

Where gaps in data exist (for example, turbidity monitoring data, pumpage data, feeder rates, etc.) maintenance records of equipment (failure/repair records) should show dates "out-of-service," etc. and indicate cause of failure (vandalism, etc.), as well as when calibrations and/or repairs were made. All turbitity analysis equipment used for compliance purposes must be calibrated each calendar quarter.

Inspectors should review current daily work sheets, instrument scales, etc. They should be labeled to show current time and date for which data is being collected (and not the "shift" date). Inspectors should also review and compare previously submitted records (MORs, and Summary Data) with recorded turbidity and chlorine chart data, daily work logs, etc. Previously submitted MORs and other reports should compare and be consistent with system strip charts, daily worksheets. The inspector should check to insure backwashes/filter to waste events are noted on strip charts. The strip charts should be labeled with date, time, place, operating scale for each day, actions taken and operator initials. Spikes in turbidtiy, omissions in data, discrepancies and anomalies should be investigated and where warranted filter profiles conducted. All records should be available at the time of the survey. If the system has had a change in certified operators since the last survey, verify that the system has documentation that the Operator Certification Board (The DWS has been designed to receive this information for the Board) has been notified.

Verify that pounds of chemicals fed (gross product) are accurate (with no purity rates taken into account) and do not reflect a "calculation." Verify that chemicals (chlorine, alum, polymers, etc.) fed are National Sanitation Foundation (NSF) approved, where applicable.

Water system personnel at the office should be able to provide the number of connections served by the system. They should have details about the number and grade level of certified operators in the system, both plant and distribution. Finally, copies of the Emergency Operations Plan (EOP), Wellhead Protection Plan and/or Source Water Protection Assessment (if made) should be available for inspection. Personnel should be familiar with the plan should implementation be required. The EOP must be current.

(B) **Source and Facility Inspection**

Source

Surface Water	True Ground Water (no filter)	True Ground Water (Iron/Manga-nese Filter Removal)	Ground Water Under the Influence of Surface Water (Avoiding Filtration)	Ground Water Under the Influence of Surface Water (Filtration)	

The second phase of the on-site inspection involves a source inspection, in addition to the treatment facility. <u>All sources</u> (wellheads, intakes, springs, etc.) must be inspected. The

inspector should compare the source(s) with the submitted wellhead protection plan or source water assessment (whichever is applicable). Aspects to be considered during the inspection include evaluating the source, operation and maintenance of the physical treatment facility, whether or not the facility is capable of meeting accepted water quality standards, whether or not the facility has met all water quality monitoring and sampling requirements, and whether results from water quality monitoring were within acceptable levels. The inspector should observe filters during a run to check efficiency.

The sanitary survey rating sheet lists items to be inspected at the office, source, treatment facility and distribution system, generally in that order. Generally the explanation of the item in this “Guidance for Rating a Public Water Supply System ” will elaborate as to what systems are applicable under the requirement. **Again, items that apply to specific categories of public water systems (displayed in the graphic boxes) are shown in BOLD.** Items are grouped under the major headings of Records, Facility, Distribution System, etc. For example under Records, TNCWSs with a True Ground Water source are not required to disinfect and therefore no records are associated with that activity (p. 4). CWSs serving fewer than 50 connections and not under the direct influence of surface water do not have to chlorinate and therefore no records would be associated with that system (DWS Rule 1200-5-1-.17(4)). On the other hand, all CWSs having 50 or more connections are required to disinfect and to have a duplicate chlorination system (p. 24). The definition of duplicate chlorination can be found in Division Rule 1200-5-1-.17(11). Systems failing to have duplicate units will be penalized. Systems having a continuous monitoring device with an alarm notifying a manned control center may be exempt from the duplicate chlorination requirement. Deficiencies in the operation of a treatment facility may be cited under the "Operation" category. The "Water Quality Monitoring" section determines whether a system performs the required sampling and analyses. Violations of established standards resulting from these analyses may be penalized under "Water Quality.

Although the inspector will evaluate the system’s laboratory under the “Facility” section, the laboratory procedures and lab monitoring program should be evaluated under the “Operation” section or phase of the survey. The person responsible for performing laboratory tests, i.e. certified operator or other designated person should be required to run operational tests required by the system’s monitoring plan. Deficiencies should be given for operators unable to correctly conduct routinely required monitoring *without the aid of a manual unless the technician is new or the procedure is new.* Deficiencies for lacking proper facilities and test equipment may be assessed under part (T), Laboratory Facilities, in the "Source and Facility" section. Deficiencies for laboratory procedures and failure to meet the requirements of the laboratory monitoring program may be cited under part (B), Laboratory - Process Monitoring, of the "Operation" section. This section may also be used to indicate a violation for operating a turbidity removal plant or iron removal plant with gravity filters without an operator in attendance. The inspector should evaluate the operator's sampling and monitoring procedures for turbidity, if applicable, to determine if the system can receive turbidity approval.

Source					
	True Ground Water (no filter)				

Ground water systems (not under the direct influence of surface water, i.e. utilizing approved sand and gravel formations) are not required to monitor turbidity (under Rules 1200-5-1-.05(11) and 1200-5-1-.08(1)).

Source					
Surface Water			Ground Water Under the Influence of Surface Water (Avoiding Filtration)	Ground Water Under the Influence of Surface Water (Filtration)	

Surface water and ground water systems under the direct influence of surface water (filtering and non-filtering) are required to monitor turbidity once every four hours that the plant is in operation. The value may be obtained by one of the following:

1. Systems which take one sample every four hours are to report the value of that sample.

2. Systems which take more than one sample every four hours are to report the **highest value** obtained.

3. Surface water and GWUDI of surface water systems which continuously monitor the finished water turbidity are to report the **highest value** obtained from the strip chart during each four hour period. Continuous monitoring equipment having automatic shut-offs and alarms should be tested to verify shut-off and alarm capability. Insure that alarms and automatic dialers work properly.

4. Subpart H systems serving fewer than 10,000 persons must not exceed 5 NTU in any representative samples of combined filter effluent water. Subpart H systems serving 10,000 or more persons must not exceed 1 NTU in any representative samples of combined filter effluent water.

5. Subpart H systems using conventional or direct filtration and serving fewer than 10,000 persons must not exceed 0.5 NTU in at least 95 percent of the measurements taken each month (unless disinfection can be achieved at higher levels), with 1 NTU in more than 5 percent being

the maximum. Subpart H systems using slow sand, diatomaceous earth filtration or other technology (including cartridge) and serving fewer than 10,000 persons must not exceed 1.0 NTU in at least 95 percent of the measurement taken each month. Subpart H systems using conventional filtration or direct filtration and serving 10,000 or more persons must not exceed .3 NTU in at least 95 percent of the measurements taken each month and may not exceed the short term turbidity limit of 1 NTU.

6. Turbidity monitoring frequency and limits should be specified for systems using point of entry (POE) or alternative technology (See Rule 1200-5-1-.29(2) and/or 1200-5-1-.31(5)(c)1.)

The following is a list of deficiencies and the category which should be used for penalty assessment.

Deficiency	Penalty Category
Unit operation or maintenance	Source and Facility (E-Y)
Filter effluent turbidimeters	Source and Facility (K)
Ground water turbidimeter	Source and Facility (N)
Failure to wash filters	Source and Facility (L)
Need lab air conditioner	Source and Facility (T)
Operator not in attendance	Operation (B)
Failure to meet lab monitoring program	Operation (B)

(C) **Distribution System Inspection**

Source					
Surface Water	**True Ground Water (no filter)**	**True Ground Water (Iron/Manga-nese Filter Removal)**	**Ground Water Under the Influence of Surface Water (Avoiding Filtration)**	**Ground Water Under the Influence of Surface Water (Filtration)**	**Purchase**

The next phase of the on-site inspection should be an evaluation of the distribution system. The function of the distribution system is to provide an adequate supply of water to all customers while maintaining finished water quality.

The inspector should inspect pump stations, reservoirs and distribution tanks looking for items which could affect the quantity or quality of water provided. Hand held pressure gauges may be used to check the static pressure at individual homes or businesses. One or more sites near dead ends should be selected for sampling chlorine residual. Before a system can be penalized for lack of chlorine, at least three representative samples must be taken from the distribution system. Distribution personnel should be questioned about flushing procedures and locations as well as regular sampling locations

for chlorine residual and bacteriological analysis. Tanks which have been valved off should be identified. Inspectors should also evaluate tank usage to determine if tanks are operated together or as separate parts and if bacteriological samples are taken to reflect usage. Determine how the system addresses these problems. Supplies should be available for disinfecting new lines and reservoirs as well as emergency repairs.

The inspector should be aware of customer complaints when evaluating the distribution system. A six point penalty may be assessed if distribution pressure has been shown to drop below 20 psi at any point up to the customer's service connection. An eleven point penalty may be given to a system whose customers were out of water (zero pressure) for an unreasonable length of time, even if the outage can be attributed to an emergency situation. Systems having galvanized piping resulting in red water complaints may be assessed a five point penalty if the system violates the secondary standard.

The inspector should talk to those responsible for the cross connection program. The inspector should have an idea of the complexity of the distribution system, i.e. the number of commercial, industrial, and institutional customers and customers with wells in order to make an evaluation of the on-going program. Consideration should be given to the level of documentation, number of surveys and re-surveys, degree of enforcement, and frequency of testing. Water use records should be reviewed to determine full-time customers that have months with low usage. There is an automatic eleven point penalty for not having an ordinance or policy and an approved plan of action. A continuing ineffective, or inactive program should be progressively penalized with each successive sanitary survey. Progressive penalties are discussed in greater detail in the “Guidance for Rating a Public Water Supply System” *(p 20)*.

(D) **Discussion of Results**

The last phase of on-site work is meeting with water system managers to discuss obvious findings or deficiencies identified during the records review, and/or the inspection. This should be done prior to leaving the site even if the final rating has not been determined due to more than one inspector being involved with the inspection. This meeting is particularly important if significant or major deficiencies are found or if the inspector knows that a change in rating categories is certain. The inspector should attempt to meet with the system manager or highest level official available, preferably one who is responsible for making decisions regarding the overall operation of the system. **They should discuss identified deficiencies and possibly those recommendations necessary for improvement**. The inspector if at all possible should discuss the actual numerical rating or proposed status with management or officials. If the system is a persistent violator then the inspector should explain that the sanitary survey letter will be a Notice of Non-Compliance and a Compliance Review Meeting may be scheduled to correct the violations. The suggested compliance time frame for violations should be discussed along with the fact that the letter will contain a compliance schedule. If the inspector knows for certain that a change of status will occur the system official should be informed of any possible change of status and the implication of such a change, such as loss of “Approved” signs as directed in section III. B. If not discussed at the conclusion of the inspection (on-site) the highest level system official such as the mayor or president of a utility district must be informed of any drop in status before the sanitary survey letter is sent to the system. The discussion with the water system manager, city manager, mayor, commissioner, owner, etc. should take place before leaving the system.

III. Documenting the Inspection

The final step of conducting a sanitary survey is to provide written documentation of the results. Items to be completed in this portion include a letter to the system detailing the findings of the on-site inspection, updating the water system's data sheet for the water system, completing the rating sheet, and submitting an SDWIS turnaround document to the Nashville Central Office. Persistent violators will require a compliance schedule be drafted and a CRM scheduled. This should be completed within two weeks of the final field visit.

(A) Survey Rating

The inspector should complete the rating sheet assessing penalty points according to the "Guidance for Evaluating A Public Water Supply System." Questions concerning the applicability of a penalty assessment may be directed to the EAC program manager. Completion of the rating sheet should place the system into one of three categories based on the score.

Category	**Rating**
Approved	90 -100
Provisionally Approved	70 - 89
Unsatisfactory	0 - 69

If it appears that a system will change classification by moving into or out of the "Approved" category, then the inspector must discuss the rating with the EAC program manager. If the classification change is for a large community water system or is potentially controversial, the Director of the Division of Water Supply should be notified. It is at the discretion of the EAC program manager to date and mail the survey letter to the system and make copies for the Nashville Central Office or send the undated survey letter to the Nashville Central Office for review, dating, and mailing to the system.

(B) "Approved" Signs

When a water system is placed in the "Approved" category, it is the policy of the Division to erect signs on state highways leading into the service area stating "Public Water Supply Approved". The system will retain the "Approved" signs as long as it remains in the "Approved" category. If an "Approved" system falls to the "Provisionally Approved" category then it may retain the "Approved" signs on a probationary basis until the next sanitary survey. At that time if an "Approved" rating is not received, the signs are to be removed. If an "Approved" system receives an "Unsatisfactory" rating, then the signs are to be removed immediately. To have signs erected or removed the inspector should prepare a letter for the Director's signature to the appropriate regional office of the Tennessee Department of Transportation (TDOT). The appendix contains a sample DOT letter as well as a list of TDOT addresses. The letter to TDOT can be sent from the EAC by the EAC program manager provided the system has been notified of sign removal prior to TDOT removing the signs.

(C) **Bacteriological Sampling**

Following completion of the rating sheet, the inspector should update the system data sheet with any changes that may have occurred since the last inspection. The number of water system connections is multiplied by the County Household Population Factor to obtain the population served by the system. This value can be compared to the values listed in Rule 1200-5-1-.07(c) to determine if the system needs to increase its bacteriological sampling rate. The population figures supplied by the water system may be substituted for the County Household Population Factor if the value has adequate documentation. The system should be notified in the survey letter if the bacteriological sampling rate is to be changed. The state laboratory (Department of Health Services) should be notified of an increase or decrease in bacteriological sampling.

(D) **SDWIS Turn-Around Document (TAD)**

A computer turnaround document must be updated for each sanitary survey so that the information may be incorporated into the SDWIS system. Turn-around documents (TAD) are usually available for each system within an EAC. If one is not available, contact the DWS' Data Management Section. As much information as possible should be included on the TAD including all persons listed on the data sheet, plant phone numbers, e-mail addresses, etc.

(E) **Survey Letter**

Results of the inspection shall be transmitted to the water system through a letter sent to the highest responsible official or owner. Other system personnel such as the Certified Operator in direct charge, superintendent or operator(s) should be sent a copy of the letter. The inspector should also send a copy of the letter to the regional and county health offices. When writing the survey letter write to the intended audience, the letter should not contain unnecessary technical language as the management officials may not be versed in the operation of a water system. Comments and recommendations should be clearly explained including the purpose for requested action when applicable. *The letter to the system should clearly list system deficiencies and request that system officials and management respond to the State in writing within 45 days as to how and when deficiencies will be addressed.* The body of the letter should contain the name of the inspector to avoid confusion when the letter contains the manager's original signature.

General specifications as to acceptable font, margins, point sizes, etc. for the survey letter are given in Appendix 1.

(F) **Documentation Package**

A documentation package should be assembled within two weeks after performing the on-site inspection. It must include a copy of the Sanitary Survey Letter, Rating Form, and original Data Sheet, SDWIS Turn-Around Document, Field Sheet and TDOT Letter. All documentation should be included when the copy is sent to the Nashville Central Office. If the population has increased to the point where additional bacteriological sampling is required by a system not performing its own analysis, then the updated bacteriological card or notice should be sent to the Division of Laboratory Services so that the proper number of bottles may be sent to the system. If a community water system (excluding condominiums and apartment complexes) moves into or out of the "Approved" category, a letter to the Tennessee Department of Transportation (TDOT) for the Director's signature requesting them to erect or remove "APPROVED" Water System signs should be prepared and sent to the Nashville Central Office. If the Sanitary Survey Letter is classified as a notice of non-compliance, then a copy needs to be sent to the DWS' Enforcement Coordinator.

The following table shows who is to be sent documentation regarding the survey and which portions they are to receive.

	Documentation Package					
Recipient	Survey Letter	Rating Form	Data Sheet	SDWIS Turn-Doc	Field Sheet	TDOT Letter
System Official/Owner	Original	Original	copy	n/a	n/a	n/a
Certified Operator (In-direct Charge)	copy	copy	copy	n/a	n/a	n/a
Regional Health Ofc	copy	copy	n/a	n/a	n/a	n/a
County Health Ofc	copy	copy	n/a	n/a	n/a	n/a
DWS EAC	copy	copy	copy	n/a	copy	copy
DWS NCO	copy	copy	Original	Original	Original	Original

(G) **Compliance Schedules**

The following is a list of suggested time schedules for achieving compliance.

Compliance Item	**Time for Compliance**
Microbiological monitoring	30 days
Microbiological MCL	45 days
Disinfection Profile	30 days
Filter Profile	30 days
Disinfection required (50 connections)	45 days
Turbidity monitoring - surface supply	30 days
Turbidity monitoring - ground water	180 days
Turbidity MCL - surface	
(a) facilities functional	30 days
(b) facilities need upgrading or repair incl individual filter bed turbidimeters	90-180 days
(c) Comprehensive performance evaluation (CPE)	90-180 days
(d) major renovation required	360 days
(e) new plant required	720 days

Turbidity MCL - ground water	360 days
Cross Connection Program	
(a) submittal of policy or ordinance	30 days
(b) submittal of plan	45 days
Certified operator	30 days
Emergency Operations Plan (EOP)	60 days
Wellhead Protection Plan	60 days
Public Notices	30 days
Business Plan	60 days
Capacity Development Plan	60 days
Record Keeping Plan	60 days
Equipment Maintenance Records	30 days
Customer Complaint Log	30 days
Organizational Chart and Job Descriptions	45 days
Low Pressure	no more than 45 days

It may be assumed that a system has made a valid effort to come into compliance if it has achieved the following:

1. Submitted required microbiological samples.
2. Ordered necessary disinfection equipment.
3. Submitted samples to a certified laboratory for chemical analysis within 30 days.
4. Submitted cross connection ordinance or policy.
5. Hired a certified operator
6. Given Public Notification

DRAFT

Sanitary Survey Rating

System: _____

Date: _____

I. System Management and Operation (15)

Points deducted in the "System Management and Operation" section should be assessed progressively. See "Guidance for Rating a Public Water System" for details on penalty assessments. For the second survey in which no substantial progress is made the point penalty for each item may be multiplied by 2.0. For the third survey in which no substantial progress is made the point penalty for each item may be multiplied by 3.0.

	Deficiency	Points Range	Deduction	Comments
A.	Ownership and Operational Organization (Organizational Chart with Job Descrip- tions) 1200-5-1-.05(8)	(5-9)	_____	_____
B.	Capacity Development Plan (all new sys- tems since 8/29/99 and all SNCs) 1200-5-1-.17(37) and (38)	(3-5)	_____	_____
C.	Business Plan (showing revenue and Expenses; see CD Plan) 1200-5-1-.17(37) and (38)	(3-5)	_____	_____
D.	Training Plan and Program (Board Members, Managers and Operators)	(1-3)	_____	_____
E.	Security Plan and Records (Treatment Facility, Tanks, Pump Stations) 1200-5-1-.17(17) and .20(1)	(1-3)	_____	_____
F.	Equipment Maintenance Plan and Records 1200-5-1-.17(17) and .20(1)(h)	(1-3)	_____	_____
G.	Emergency Operations Plan 1200-5-1- .17(7)	(3-5)	_____	_____
H.	Submission Of Plans and Specifications 1200-5-1-.05	(2-7)	_____	_____
I.	Construction Projects 1200-5-1-.05(4), (6) and .17(8) and (19)	(2-5)	_____	_____
J.	Monitoring Plan (Bacteriological, Chemical, etc.)	(2-5)	_____	_____
K.	Record Keeping Plan (Management, Facility and Distribution Records) 1200-5-1-.20	(1-7)	_____	_____
L.	Submission Of Monthly Operations Reports (MORs) 1200-5-1-.17(2)	(2-5)	_____	_____
M.	Reporting Requirements 1200-5-1-.18	(2-5)	_____	_____
N.	Customer Complaint Log and Policy 1200-5-1-.17(24)	(2-5)	_____	_____
O.	Public Notification 1200-5-1-.19	(3-5)	_____	_____
P.	Consumer Confidence Reports 1200-5-1-.35	(2-5)	_____	_____
Q.	Enforcement TCA 68-221-712(a)	(2-5)	_____	_____

Deficiency Subtotal _____

2. Operator Compliance (11)

	Deficiency	Points Range	Deduction	Comments
A.	Certified Operator - Plant and Distribution System 1200-5-1-.17(1) and 1200-5-3-.04(2)	(11-15)	_____	_____
B.	Availability of Certified Operator(s) and Operating Procedures 1200-5-3-.04(3)	(1-7)	_____	_____

Deficiency Subtotal _____

3. Source (10)

Points deducted in the "Source" section should be assessed progressively. See "Guidance for Rating a Public Water System" for details on penalty assessments. For the second survey in which no substantial progress is made the point penalty for each item may be multiplied by 2.0. For the third survey in which no substantial progress is made the point penalty for each item may be multiplied by 3.0.

	Deficiency	Points Range	Deduction	Comments
A.	Adequate Supply 1200-5-1-.02, .16 and .17(13)	(3-7)	_____	_____
B.	Duplicate Pumps 1200-5-1-.17(13)	(1-7)	_____	_____
C.	Wellhead/Springbox Construction (if applicable) 1200-5-1-.02(1), .05(12), .16 and .17(3) and (16)	(1-3)	_____	_____
D.	Intake 1200-5-1-.02 and .16	(1-2)	_____	_____
E.	Source Protection (Well head Protection Plans, etc.) 1200-5-1.34	(1-5)	_____	_____

Deficiency Subtotal _____

4. Treatment (17)

Points deducted in the "Treatment" section should be assessed progressively. See "Guidance for Rating a Public Water System" for details on penalty assessments. For the second survey in which no substantial progress is made the point penalty for each item may be multiplied by 2.0. For the third survey in which no substantial progress is made the point penalty for each item may be multiplied by 3.0.

	Deficiency	Points Range	Deduction	Comments
A.	Aerator 1200-5-1-.02	(2-5)	_____	_____
B.	Chemical Feeders 1200-5-1-.05 (8) and .17(36)	(2-5)	_____	_____
C.	Mixing 1200-5-1-.02	(2-5)	_____	_____
D.	Flocculation 1200-5-1-.02	(1-2)	_____	_____
E.	Sedimentation 1200-5-1.02	(2-5)	_____	_____
F.	Filtration 1200-5-1-.17(12) and (27)	(1-5)	_____	_____
G.	Re-Wash (I.e. Filter-to-Waste) 1200-5-1-.17(35)	(3)	_____	_____
H.	Turbidimeters 1200-5-1-.05(11) and .17(1) including alarm and automatic shut-off capability	(3-7)	_____	_____

I.	Disinfection 1200-5-1-.02, .17(4), (11), and (28)	(3-10)	_____	_____
J.	Disinfection Contact Time 1200-5-1-.02, .17(28), and (29)	(2-5)	_____	_____
K.	Master Meter 1200-5-1.17(2) and (3)	(1-3)	_____	_____
L.	Maintenance of Equipment, Buildings and Grounds 1200-5-1-.02, .17(3), (17) and (19)	(3-7)	_____	_____
M.	Laboratory Facilities 1200-5-1-.02, .14, .17(3), (17) and (26)	(2-5)	_____	_____
N.	Safety 1200-5-1-.02	(1-3)	_____	_____
O.	Sludge Handling/Backwash Recycling 1200-5-1-.02	(2-5)	_____	_____
P.	Sanitary Conditions 1200-5-1-.17(17)	(2-5)	_____	_____
Q.	Fluoridation Techniques 1200-5-1-.17(20)	(1-3)	_____	_____
R.	Design Capacity 1200-5-1-.05(10)	(1-3)	_____	_____
S.	Filter Backwash 1200-5-1-.31(9)	(1-3)	_____	_____

***** Note: 1200-5-1-.17(3), (17) and (19) are more specific rule cites per equipment and facility condition; 1200-5-1-.18(2) may also apply.

Deficiency Subtotal _____

5. Monitoring, Reporting and Data Verification (20)*

	Deficiency	Points Range	Deduction	Comments
A.	Laboratory-Process Monitoring (excluding Turbidity and Chlorine Residual Monitoring) 1200-5-1-.17(3)	(2-5)	_____	_____
B.	Turbidity Monitoring -			
	a. Daily sample 1200-5-1-.08 (1), .17(26), .31(4) and .31(5)(c)	(2-11)	_____	_____
	b. Repeat sample 1200-5-1-.08(2)	(2-5)	_____	_____
C.	Chlorine Residual Monitoring 1200-5-1-.17(4), .17(30), .31(5)(b) and (c)2	(1-2)	_____	_____
D.	Primary Chemicals Compliance Monitoring			
	a. Inorganic Samples 1200-5-1-.09(1)	(1-5)	_____	_____
	b. Inorganic Samples – Confirmation 1200-5-1-.09(2)	(3)	_____	_____
	c. Synthetic Organic Samples – Regulated and Unregulated 1200-5-1-.10(1) and .28	(3-10)	_____	_____
	d. Synthetic Organic Samples – Confirm			
	e. Radionuclides 1200-5-1-.11	(2-5)	_____	_____
	f. Sodium 1200-5-1-.24	(1-3)	_____	_____
	g. Trihalomethanes 1200-5-1-.23	(3-7)	_____	_____
	h. Volatile Organic Chemicals 1200-5-1-.26	(2-5)	_____	_____
	i. Confirmation samples	(1-3)	_____	_____
E.	Secondary Chemicals 1200-5-1-.12	(2-5)	_____	_____
F.	Bacteriological			
	a. Regular Samples 1200-5-1-.07	(1-3)	_____	_____
	b. Repeat Samples 1200-5-1-.07(1)	(1-3)	_____	_____
	c. Bacteriological Sampling Plan 1200-5-1-.07(1)(c)	(3-4)	_____	_____
G.	Lead and Copper Monitoring			

	a. Regular Samples 1200-5-1-.33	(6)	_____	_____
	b. Documentation 1200-5-1-.33	(2-3)	_____	_____
	c. Corrosivity 1200-5-1-.21	(3-5)	_____	_____
H.	Disinfection/Disinfection By-Products Monitoring	(2-5)	_____	_____ _____
I.	Turbidity Compliance			
	a. Monthly Average 1200-5-1-.06(3)(a)	(7-11)	_____	_____
	b. Two-Day Average 1200-5-1-.06(3)(b)	(7-11)	_____	_____
	c. 95% of samples not <.5 NTU	(7-11)	_____	_____
J.	Primary Chemicals Compliance			
	a. Inorganic Chemicals 1200-5-1-.06(1)(b)	(6-11)	_____	_____
	b. Organic Chemicals 1200-5-1-.06(2)	(6-11)	_____	_____
	c. Radionuclides 1200-5-1-.06(5)	(6-11)	_____	_____
	d. Trihalomethane 1200-5-1-.22(3)	(6-11)	_____	_____
	e. Volatile Organic Chemicals (Regulated) 1200-5-1-.25	(6-11)	_____	_____ _____
K.	Secondary Chemicals Compliance 1200-5-1-.12	(3)	_____	_____ _____
L.	Bacteriological Compliance Monthly Average 1200-5-1-.06(4)(a)	(5-11)	_____	_____ _____
M.	Lead and Copper Action Level 1200-5-1-.21	(3-7)	_____	_____
N.	Disinfection/Disinfection By-Products	(3-7)	_____	_____

***** Refer also to 1200-5-1-.05(11) and (12), .08(2), and .17(3) and (25)

Deficiency Subtotal _____

6. Finished Water Storage (10)

Points deducted in the "Finished Water Storage" section should be assessed progressively. See "Guidance for Rating a Public Water System" for details on penalty assessments. For the second survey in which no substantial progress is made the point penalty for each item may be multiplied by 2.0. For the third survey in which no substantial progress is made the point penalty for each item may be multiplied by 3.0.

	Deficiency	Points Range	Deduction	Comments
A.	Adequate Storage 1200-5-1-.17(14)	(5-7)	_____	_____
B.	Inspection and Maintenance of Reservoirs, Tanks and Clearwell 1200-5-1-.17(16), (17), (33) and (34)	(3-7)	_____	_____ _____ _____

Deficiency Subtotal _____

7. Pumps, Pump Facilities and Controls (3)

Points deducted in the "Pumps, Pump Facilities and Controls" section should be assessed progressively. See "Guidance for Rating a Public Water System" for details on penalty assessments. For the second survey in which no substantial progress is made the point penalty for each item may be multiplied by 2.0. For the third survey in which no substantial progress is made the point penalty for each item may be multiplied by 3.0.

	Deficiency	Points Range	Deduction	Comments
A.	Pump Stations 1200-5-1-.02(1) and .17(9) and (13)	(2-3)	_____	_____ _____

B.	Maintenance of Pumping Equipment 1200-5-1-.02 and .17(13)	(2-3)	_____	_____ _____

Deficiency Subtotal _____

8. Distribution System and Cross Connection Controls (14)

Points deducted in the "Distribution System and Cross Connection Controls" section should be assessed progressively. See "Guidance for Rating a Public Water System" for details on penalty assessments. For the second survey in which no substantial progress is made the point penalty for each item may be multiplied by 2.0 For the third survey in which no substantial progress is made the point penalty for each item may be multiplied by 3.0.

	Deficiency	Points Range	Deduction	Comments
A.	Chlorine Residual 1200-5-1-.17(4)	(5-9)	_____	_____
B.	Notification, Inspection and Disinfection of New or Existing Facilities 1200-5-1-.17(8), (19) and .20(1)	(2-3)	_____	_____
C.	Flushing Program 1200-5-1-.17(10) and (23)	(5-9)	_____	_____
D.	Fire Hydrants 1200-5-1-.17(18)	(3-7)	_____	_____
E.	Adequate Pressure 1200-5-1-.17(9)	(5-9)	_____	_____
F.	Valves and Blow-offs 1200-5-1-.17(10) and (23)	(2-5)	_____	_____
G.	Map of Distribution System 1200-5-1-.17(15)	(3-5)	_____	_____
H.	Approved Cross Connection Policy or Ordinance 1200-5-1-.17(6)	(8)	_____	_____
I.	Working Cross Connection Program 1200-5-1-.17(6)	(5-9)	_____	_____

Deficiency Subtotal _____
Total Deficiency Points _____
Overall Rating _____
Inspector's Signature _____

Additional Comments/Explanation:

_____

_____

_____

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3 - Sanitary Survey Manual (Part 2) Revised 06 Jan 2003 (Compiled Form)

Guidance for Rating a Public Water Supply System

The following guidance is to be used by the staff of the Division of Water Supply while conducting on-site evaluations (sanitary surveys) of Public Water Systems (PWSs). The points assigned to each section are the maximum deficiency points that can be assigned to that group of items. Deductions for particular items are progressive over time. This means if deficiencies are not addressed by a system and the deficiencies persist the penalty deductions in subsequent sanitary surveys shall be multiplied by a factor of 2 or 3. Under this guidance, points deducted in each would be assessed progressively up to the Section maximum. See "Guidance for Rating a Public Water System" for details on penalty assessments. For the second survey in which no substantial progress is made the point penalty for each item may be multiplied by 2.0. For the third survey in which no substantial progress is made the point penalty for each item may be multiplied by 3.0. For example, if a water system does not have a back-up feeder (Item 4B, Chemical Feeders) and receives a 3 point deduction in a sanitary survey, the deduction increases to 6 points on the next survey, and if it is still not addressed, increases to a 9 point deduction on the third survey. If on the second and third surveys points were also deducted for not having duplicate disinfection equipment (a 5 point deduction on the first survey, 10 points on the second and 15 points on the third) the system would receive a 25 point deduction, the maximum number of points which could be deducted under the "Treatment" section of the Survey. Similarly, systems are given deductions for an inadequate cross connection program (as determined by the approved plan). They may be penalized on an initial survey relative to three categories, falling behind (3 points), significantly behind (7 points), or little or no observable progress (11 points). If on an initial survey a system received an 11 point deduction and little or no progress is made on a subsequent survey (second survey), 22 points would be deducted. **If on the second survey the system implemented its cross connection inspection program, but was significantly behind, 14 points would be deducted rather than the 22 points. In other words, the overall progressive penalty may be decreased based on progress made by the system, but is still determined to have an inadequate program.** The second sanitary survey in which no progress has been made on a given item shall have the deduction multiplied by 2 and on the third survey in which no substantial progress is made the point penalty shall be multiplied by 3.0. The points which can be deducted under each section remain the maximum deficiency points assigned to that group. Where a progressive deduction of points is applied the maximum number of points to be deducted under a group remains effective. *Items which are "critical" to the production or management of a system by DWS Staff must be addressed by the public water system (PWS) immediately. In those instances the system will receive a NOV or NONC which initiates enforcement procedures to achieve compliance.*

1. SYSTEM MANAGEMENT AND OPERATION (15)

These ratings will be sufficient provided the progressive point penalty is approved and used. Otherwise it will need to be revised to simply say 1 point for each item, without a limit.

A. **Ownership and Operational Organization** (Organizational Chart with Job Descriptions)

System Category		
CWS (Community Water System)	**NTNCWS (Non-Transient Non-Community Water System**	**TNCWS (Non-Transient Non-Community Water System**

Rule 1200-5-1- .05(8) requires all public water systems to notify the Division of Water Supply (DWS) and to have a charter or other appropriate authorization to operate. In keeping with this requirement the system must provide information as to the name, address and telephone number of the **owner(s)** or ultimate responsible party of the facility or public water system. Leaseholders or business owners may be included but they are not the ultimate responsible party.

Rating:
5 pts if system is **not** properly organized (i.e. incorporated, chartered, registered, etc. with an organizational chart and appropriate job descriptions)
3 pts if system is incorporated or chartered, but does neither an organizational chart **or** job descriptions
1 pts if system is properly organized, but lacks either an organization chart **or** job descriptions (one but not both)

B. **Capacity Development Plan** (all new systems since Aug 29, 1999 and all SNCs)

System Category		
CWS (Community Water System)	**NTNCWS (Non-Transient Non-Community Water System**	**TNCWS (Non-Transient Non-Community Water System**

All new community public water systems established since August 29, 1999 and all Significant Non-Compliers (SNCs) and Potential Significant Non-Compliers shall submit a Capacity Development Plan for review and approval by the Department. The Capacity Development Plan consists of the various operating guides or plans for all aspects of the water system. Components of the Capacity Development Plan include a Monitoring Plan, Equipment Maintenance Plan, a Security Plan, an Emergency Operations Plan, a Bacteriological Site Sampling Plan, a Record Keeping Plan, a Business Plan, etc. Together, these plans when followed assure the continuous satisfactory operation of a public water system. The Capacity Development Plan may include a Capital Improvements Plan and Budget addressing the expansion and long-term development needs of the system. (See Rules 1200-5-1-.04(3), (4), (84) and 1200-5-1-17(37) and (38).)

Rating:

3-5 pts - if system does not have a capacity development plan that lists all required component plans, dates of preparation and location of components. Each component plan, e.g. Security Plan, Business Plan, Emergency Operations Plan (EOP), Monitoring Plan, Bacteriological Site Sampling Plan is assessed on its own merits; the Capacity Development Plan shall simply list all components, include dates of preparation and revision, and their physical location. (Note: DWS staff may not be given access to the Security Plan unless authorized by the PWS, nevertheless information concerning its availability to system staff, dates of revision, etc. can be discussed.)

C. **Business Plan** (showing revenue and expenses)

System Category

CWS (Community Water System)	NTNCWS (Non-Transient Non-Community Water System	TNCWS (Non-Transient Non-Community Water System

The plan shall identify source(s) of income or revenue sufficient to meet expenses over a three (3) year period. The business plan will identify costs related to retaining a certified operator, estimated annual infrastructure repair cost, depreciation, facility maintenance fees, estimated annual monitoring costs, estimated costs of providing public notices, estimated administrative costs, and any other operational, treatment, and related costs (e.g. chemicals and other supplies used to treat water, etc.). The business plan must include the re-payment of borrowed and amortized funds. (See Rules 1200-5-1-.04(3), (4), (84) and 1200-5-1-17(37) and (38).)

Rating:

3-5 pts for water systems that do not have a Business Plan but have been required to have a Business Plan. The plan must identify sources of income or revenue sufficient to meet expenses. The adequacy of the business plan shall be determined using the DWS' worksheet as a basis. Points assessed should be based on completeness of items addressed, and obvious omissions.

D. **Training Plan and Program** (Board members, Managers and Operators)

System Category

CWS (Community Water System)	NTNCWS (Non-Transient Non-Community Water System	TNCWS (Non-Transient Non-Community Water System

Board Members, Managers and Operators of a public water system should be acquainted and familiar with the operating guidelines, policies, procedures, risks, and requirements for which they are assigned and are responsible. Accordingly,

management, operators, and other staff should be trained and adhere to a training plan which shall review requirements, procedures and policies. Operators that are certified shall obtain continuing education credits which will enhance and maintain their abilities for the tasks engaged in. (See Rules 1200-5-1-.04(3), (4), (84) and 1200-5-1-17(37) and (38); also Rule 1200-5-3-.04(3) and .05(1).)

Rating:

2 pts for failing to have a training plan which would provide appropriate training to operators, management, and others for the responsibilities and risks which they have assumed or have been assigned.

1-3 pts for systems that fail to train board members, operators, management, and others for the responsibilities and risks which they have assumed or have been assigned.

E. **Security Plan and Records** (Treatment Facility, Tanks, Pump Stations)

System Category

CWS (Community Water System)	NTNCWS (Non-Transient Non-Community Water System	TNCWS (Non-Transient Non-Community Water System

By either March 31, 2003 or June 30, 2004 (depending on population served) community water systems must have conducted a vulnerability assessment and initiated planning which addresses identified risks. Possible risk reduction actions considered by these systems should include: increased distribution system monitoring of chlorine, pH and/or other quality control checks, short response times to complaints, emergency response plans addressing major line breaks, chemical spills, and other situations; standardized logos on vehicles and uniformed personnel, emergency response training of staff, the use of current anti-virus software, etc.

At this time DWS staff will not be reviewing or assessing penalties with respect to these documents. The vulnerability assessments are being required by EPA and DWS staff will not be reviewing these documents. However, DWS staff will inspect and review other records of PWSs to insure that all buildings, storage tanks, chemicals, well heads, pump stations, meter pits and equipment used in and for the production and distribution of water (including chemical and other storage buildings) are reasonably secure from break-ins, vandalism, theft and sabotage. (See Rule 1200-5-1-.17(17).) System policies and procedures should be in place which insure the security of personnel, facilities and equipment. Such policies and procedures should specify and rely on locked doors or gates, locked windows or other openings secured by bars or fencing, motion detectors, alarms, electronic surveillance, patrols, panic buttons, and other measures deemed reliable. Staff should be able to access these items independent of any system vulnerability assessment. Public Water Systems must maintain records of incidents of vandalism, break-in, theft, and trespass. These records are to be used to determine if the security measures considered and taken by a system are adequate.

Rating:

3 pts for failing to have security measures which address several minor security issues confronting the water system.
5 pts for systems that failing to address a major security issue confronting the water system.
3 pts for systems that fail to maintain detailed and complete records pertaining to break-ins, vandalism, theft and sabotage of water system facilities, including treatment facilities, pump facilities, storage tanks and reservoirs, mains, valves and hydrants.
7 pts for systems that fail to address continued break-ins and vandalism at facilities as identified by record keeping.

F. **Equipment Maintenance Plan and Records**

System Category

CWS (Community Water System)	NTNCWS (Non-Transient Non-Community Water System	TNCWS (Non-Transient Non-Community Water System

Equipment, such as chemical feeders, turbidimeters, pumpage meters, pumps, alarm systems, and air tanks, should be maintained and in good working condition. Policies should be in place that insure that pumps, tanks, rods, hoses and other equipment used by system personnel are clean and dedicated to their particular use. Furthermore, Public Water Systems must maintain records of inspection and maintenance, breakdowns, repairs made, dates out-of-service, and where breakdowns are numerous or inoperable periods of service excessive, duplicate equipment should be obtained. (See Rule 1200-5-1-.17(17) and .20).)

Rating:
3 pts for failure to maintain an Equipment Maintenance Plan and Records.
2 pts for the omission of significant equipment or several pieces of lesser but essential pieces of equipment
1 pt for less serious omissions

G. **Emergency Operations Plan (EOP)**

System Category

CWS (Community Water System)		

All community water systems must have an approved up-to-date emergency operation plan (completely reviewed and revised as necessary every 3 years) to safeguard the water supply and to alert the public of unsafe drinking water. The plan must address emergencies, including but not limited to: drought, flooding, prolonged freezing weather and subsequent thaws, loss of a water storage facility,

loss of electrical power, loss of source, major fire, contamination to source, chemical release and major water main break. (See Rule 1200-5-1-.17(7)). The plan should be available at both the plant and the office. Call lists must contain current telephone numbers, chemical suppliers, etc. It should be revised as updates are made to the plant, its processes and distribution system. In the event of an emergency the plan must be implemented to protect supplies. The consecutive water system may enter into an agreement indicating the intent to cooperate with the parent water system in the event of an emergency that interrupts water service and conveying its willingness to supply alternative potable water during a state of emergency if needed.

Rating:

5 pts if system does not have an approved Emergency Operations Plan.

3 pts for not having plan-on-hand or the plan has not been revised and approved with the past year years

3-5 pts for not enacting plan in emergency

H. **Submission of Plans and Specifications**

System Category

CWS (Community Water System)	NTNCWS (Non-Transient Non-Community Water System	TNCWS (Non-Transient Non-Community Water System

All water systems are required to submit plans and specifications to the Department and receive approval prior to construction of water projects. TCA 68-221-706 states: **"No new construction shall be done nor shall any change be made in any public water system until the plans for such new construction or change have been submitted to and approved by the Department."** This means the extension of **new lines**, regardless of length, must be approved by the Department or the system must have delegated authority to review plans before construction. . Plans are required for **all** new construction. The only exception regarding plans is the replacement of lines with the same size lines of less than 200 feet. Where this procedure has not been followed the Division of Water Supply's policy on "as-builts" applies in addition to the point deduction recorded during the survey. The **installation of fire hydrants** must be approved before construction. Line replacement programs due to highway or bridge construction, **upgrading of system or replacing line** no longer giving acceptable service must be approved by the Department prior to construction. Emergency line **replacement** due to washed-out line, severed joints of pipe broken, or a clogged line does not have to have prior approval but should follow Division guidance governing disinfection, flushing and bacteriological sampling. Individual service lines are not required to be approved before construction. Service lines are defined as a line to serve one and only one customer. **Water systems will not be penalized for water construction projects for which they do not have control provided the system has refused its connection for water service until all state requirements are met.** Projects must be constructed in accordance with approved plans unless a change order has been approved by the Department. (Also see Rule 1200-5-1-.05.)

Rating:

7 pts if system constructs project(s) without obtaining approval from the Department. Penalty may be reduced to **4 points** for line extensions less than 1,000 feet in total length upon request to the EAC program manager if the following conditions are met:

1. Project will apparently have no adverse effect on quantity or quality of water available to all customers.
2. Project was apparently constructed in accordance with Department design criteria.
3. "As-built" plans are submitted to the Department for the project in question within 45 days after the Department notifies the system of the violation.

2 pts if system fails to submit "As-built" Plans within 60 days of completing construction.

The four-point provision may only be utilized once within a sanitary survey period (typically 24 months).

I. Construction Projects

System Category

CWS (Community Water System)	NTNCWS (Non-Transient Non-Community Water System	TNCWS (Non-Transient Non-Community Water System

Water systems are to notify the Division of Water Supply as to the date construction on any project over which the water system has "control" is to begin; unless the system has a proposal that the Division has accepted in place of individual notification. ("Control" means the water system is funding the project and hiring the contractor or constructing the project using system staff.) Line extensions of less than 1000 feet are exempt from the notification requirement. Approved plans and specifications must be maintained at or near the job site during construction. The Division of Water Supply is to be informed before a new or modified water treatment plant is started up. All projects must be constructed in accordance with plans unless unforeseen circumstances prohibit construction as planned.

Rating:

2-5 pts if water system fails to notify the Division of Water Supply prior to new or modified plant start-up or if it fails to maintain a set of approved construction plans and specifications near the job site on a project under the water systems' supervision and control or if not constructed as planned.

2-3 pts if water system fails to notify the Division of Water Supply prior to utilizing new water lines or if it fails to maintain a set of approved construction plans and specifications near the job site on a project under the water system supervision and control or if not constructed as planned.

J. **Monitoring Plan**

System Category		
CWS (Community Water System)	**NTNCWS (Non-Transient Non-Community Water System**	**TNCWS (Non-Transient Non-Community Water System**

Public Water systems must have a comprehensive monitoring plan. (See Rule 1200-5-1-.07(1)(c) and (d), Rule 1200-5-1-.12(1), Rule 1200-5-1-.17(3) and (5), Rule 1200-5-1-.33(7) and (8) and Rule 1200-5-1-.36(6)(f).) The plan should identify all parameters to be monitored (including Benzo(a)pyrene and asbestos if applicable) and include a schedule for monitoring. Such plan will include all bacteriological and chemical contaminants, radionuclides, turbidity, chlorine residual, etc. required by and in accordance with Division rules. One component of the Monitoring Plan should be a **Bacteriological Site Sampling Plan** (Information and guidance material is available upon request. Points for the failure to have a bacteriological sampling plan are assessed in section 5.F.) The number of samples required must reflect the population/samples table shown in the Rules.) The Monitoring Plan should include (or execute) a **consolidation agreement** with parent water systems (monitoring is not required where criteria is met by submetered systems) for the monitoring of lead and copper tap water (Points for the failure to have a lead and copper agreement are assessed in section 5.G. dealing with lead and copper monitoring). The Monitoring Plan should also note any parameters wavered and when a parameter waiver expires. (Data generated as a result of monitoring according to this plan shall be handled according to a Record Keeping Plan.)

Rating:

3-7 pts Penalty is 3 points for each major section of the monitoring plan required for the system but omitted (with 7 points maximum). Sections shall include: Bacteriological Monitoring, Turbidity Monitoring, Chlorine Monitoring, Inorganic Chemicals (IOCs), Organic Chemicals, Volatile Organic Chemicals (VOCs), Radionuclides, Disinfection By-Products, Lead and Copper Monitoring, Secondary Chemicals, and Operating Parameters Monitoring.

K. **Record Keeping Plan (Management, Facility, and Distribution System Records**)

System Category		
CWS (Community Water System)	**NTNCWS (Non-Transient Non-Community Water System**	**TNCWS (Non-Transient Non-Community Water System**

An overall Record Keeping Plan shall be developed and maintained by all public water systems. (See Rule 1200-5-1-.17(6), .17(8), .17(10), .17(24), and .20.) The plan should address the specific records to be maintained by the system, period of retention and location where the records are kept. Records kept shall include storage tank inspection and maintenance reports, individual facility maintenance

records, flushing records with beginning and ending chlorine residuals, chlorine residuals at new taps, facility security records (including vandalism, break-in, theft, and trespass), equipment maintenance and repair records (maintenance, calibrations, dates out-of-service, and repairs of pumps, meters, feeders and alarms), line breaks - maintenance and repair, distribution maps. In addition, records that must be kept include: bacteriological sample analyses, cross connection plans and inspection records, chemical analysis, sanitary surveys, actions to correct violations, turbidity records (including individual filter bed data), daily worksheets and shift logs used to produce Monthly Operations Reports (MORs), lead and copper related records, and public notices. All water systems are required to keep certain records on file for a specific time period. Failure by the water system to organize and maintain records according to the following time frames is a violation. (Note: The failure to monitor and maintain records for specific parameters applicable to a system is reviewed in "Water Quality and Water Quality Monitoring.") Water systems must make available bacteriological and other records to the public.

Bacteriological results (routine, repair, repeat, elevated routine, etc)	5 years
Chemical analyses	10 years
Sanitary Surveys or other reports	10 years
Action taken regarding violations	3 years
Polymer Report	3 Years
Public Notifications	3 Years
Notifications of Construction	survey to survey
New Tap Records	survey to survey
Turbidity records (including labeled recording charts and calibration records)	3 years or from survey to survey (i.e. longer of the two)
Records of variance and exemption	5 years
Daily worksheets, shift logs and MORs	survey to survey
Facility and Equipment Maintenance Records (including tank Inspection and maintenance)	5 years
Line Repair/Bacteriological records	5 years

All records (listed above) must be maintained in a logical order and readily available to the general public for review during normal business hours.

Rating:

1 pt for records or data that is missing, though records generally available to the public to review.

3 pts for each type/group of records not maintained and/or available to the public

7 pts if system fails to maintain three or more types of records.

2-5 pts if records are not organized and available to the public.

L. **Submission of Monthly Operation Reports (MORs)**

System Category

CWS (Community Water System)	NTNCWS (Non-Transient Non-Community Water System	TNCWS (Non-Transient Non-Community Water System

and

Source

Surface Water	True Ground Water (no filter)	True Ground Water (Iron/Manganese Filter Removal)	Ground Water Under the Influence of Surface Water (Avoiding Filtration)	Ground Water Under the Influence of Surface Water (Filtration)	Purchase

And true ground water systems with 50 or more connections or 150 or more individuals.

Each public water supply must submit an accurate Monthly Operation Report (MOR) containing all the required information. For example, a system classified as a distribution system must record the chlorine residual five days a week and the daily volume of water purchased. All Monthly Operation Reports (MORs) must be received in the appropriate EAC by the 10th of the following month. Credit may be given for a lost report if it is on file with the system and the system does not have history of being late with reports. A system shall be penalized if it has received a NOV citing submittal of a late or missing report since the last Sanitary Survey. The MOR shall accurately reveal the operation and performance of the water system during the reporting period.

Rating:
Late Reports
1 pt for one report received late.
2 pts for two reports received late, provided the system was notified after the first late MOR.
4 pts for three or more reports received late.

Non-submittal of Reports
2 pts for each month a report is not received.

Completion of Reports
1-4 pts for failure to complete reports as required.

M. **Reporting Requirements**

System Category		
CWS (Community Water System)	**NTNCWS (Non-Transient Non-Community Water System**	**TNCWS (Non-Transient Non-Community Water System**

All systems shall report to the Division within **twenty-four (24) hours** of the failure to comply with Division drinking water regulations or other requirements (including failure to comply with monitoring, maximum contaminant level or treatment technique requirements) as set forth in the Rules and Regulations (1200-5-1-.18), and in case of any of the following events shall, no later than closing of the next business day, notify the Division and responsible local officials:

a. any major breakdown or failure of equipment (including chemical feeders, pumps, etc.) in water treatment process which affects the quality or quantity of the water leaving the treatment plant;
b. any serious loss of water service due to a failure of transmission or distribution facilities, including breaks exceeding 24 hours to repair should be reported;
c. any situation with the water system which presents or may present an imminent and substantial endangerment to health, i.e. fecal, nitrate, primary chemical or turbidity MCL, an identified cross connection, etc.
d. any failure to monitor within a required compliance period.

Rating:
7 pts if water system fails to notify the Division of Water Supply of any of the above situations (except “d”) as required by rules.
2 pts if water system fails to notify the Division of Water Supply of any failure to monitor.

N. **Customer Complaint Log**

System Category		
CWS (Community Water System)		

All Community Water Systems (CWS) must establish and maintain a file on customer water quality and quantity related complaints. This file is to include date of complaint, name and address of customer, nature of complaint, and steps and dates taken to investigate and resolve complaint (Rule 1200-5-1-.17(24)). Complaint logs must be kept in an organized fashion that can be readily available for review.

Rating:
5 pts for failure to maintain a system to track customer complaint actions.

3 pts if system's log is seriously inadequate, disorganized or incomplete
1 pt if minor problems exist

O. **Public Notification**

System Category

CWS (Community Water System)	NTNCWS (Non-Transient Non-Community Water System	TNCWS (Non-Transient Non-Community Water System

Efforts to inform customers of violations, Boil Water Advisories, and community education should be kept in a file. All water systems which fail to meet a primary drinking water standard, fail to monitor for a primary contaminant during a compliance period, or fail to apply a required treatment technique must notify the affected system's customers (consecutive public water systems must notify their affected customers) through a timely public notice given according to regulation 1200-5-1-.19 and .20. In addition, public water systems must give public notice in the event of disease outbreak or any other situation which may present an imminent and substantial endangerment to health.

The full penalty will not be assessed for failure to provide public notification for occasional incomplete bacteriological monitoring. Systems which take some but not all of the required routine bacteriological samples during a compliance period are required to give notification information and will be penalized 2 points for failure to do so. Systems having three routine sampling violations will be assessed five points for failure to provide notification. The 2 point provision is only applicable to routine monitoring violations (including elevated routine monitoring) and may not be used for repeat sample violations. The public notification must comply with federal mandatory language requirements.

Rating:
9 pts for failure to provide public notification of a Tier 1 violation as required by Rule
5 pts for failure to provide public notification of a Tier 2 or Tier 3 violation as required
3 pts if public notification does not contain mandatory language
3 pts for public notice given late.
3 pts for failure to provide copy of notification to the Division.
3 pts if water system takes some, but not all of the required bacteriological samples during a compliance period and fails to give public notice as required provided the number of months failing to provide public notification does not exceed 2.

P. **Consumer Confidence Reports (CCRs)**

System Category

CWS (Community Water System)		

All CWSs are required to provide annually every customer with a Consumer Confidence Report (CCR). (See Rule 1200-5-1-.35.) The report must be delivered to water customers and the state by July 1 each year. Content (information on source, monitoring results, and violations) and language (definitions and health information) in the CCR must comply with federal and state reporting requirements. Within 3 months the water supplier must submit certification as to the form and manner the notice was given to customers. It is suggested the certification be submitted along with the CCR.

Rating:
10 pts for failure to meet deadline after being notified by the State by mail.
3-5 pts for failure to meet content and language requirements.
5 pts for failure to meet an annual delivery deadline.
2 pts for failure to maintain a copy 5 years.
3 pts for failure to provide certification

Q. **Enforcement**

System Category

CWS (Community Water System)	NTNCWS (Non-Transient Non-Community Water System	TNCWS (Non-Transient Non-Community Water System

Any water system which has come under formal enforcement by the Department must fulfill the requirements of compliance schedules resulting from a Commissioner's Order, Director's Order or any Agreed Order or any Final Agreed Order, Judgment or Decree. Also, any requirements set forth in a Letter of Agreement (LOA) or Notice of Non-Compliance must be fulfilled.

Rating:
2 pts for each non-critical item not complied with
3 pts for each critical item not complied with
5 pts for failure to comply with Letter of Agreement (LOA) or Notice of Non-Compliance
5 pts for failure to comply with schedules resulting from Commissioner's Order or Agreed Order.

2. OPERATOR COMPLIANCE (11)

These ratings will be sufficient provided the progressive point penalty is approved and used. Otherwise it will need to be revised to simply say 1 point for each item, without a limit.

A. Certified Operator

System Category

CWS (Community Water System)	NTNCWS (Non-Transient Non-Community Water System	TNCWS (Non-Transient Non-Community Water System*

***And** serving water 60 or more consecutive days
or 120 days or more a year.

All water treatment facilities and/or distribution systems must have the person in direct charge certified under the Water Environmental Health Act (TCA 68-221-904). A person in direct charge shall mean the person or persons, whose decisions and directions to system personnel control the manipulation of equipment and thereby determine the quality and quantity of the water supplied by the water treatment plant or water distribution system. The individual(s) in direct charge of the treatment facility and distribution systems must be expressly designated to be in direct charge and so named in writing to the Division of Water Supply by the water supply system. The person in direct charge of the treatment facility and distribution system must have the appropriate certification in accordance with the classification system of the Board of Certification. A system that has an operator who is certified but is not in direct charge will not be given credit for meeting the certification requirements. The system must also show proof of retention of certified operator (copy of signed Operator Agreement) except where on a full-time payroll.

•

Systems which lose their certified operator are required to notify the Operator Certification Board and the Division of Water Supply in writing within 30 days of the loss of the certified operator. "The Board may allow a public water system a period of up to 6 months for the replacement of a certified operator whose services have been lost by death, illness or other unusual event." Systems seeking addition time to replace an operator will be penalized for the time the system is without a certified operator.

Rating:
11 pts if either plant or distribution certification requirements are not met.
15 pts if both plant and distribution certification requirements are not met.
11 pts if the operator in direct charge has not been designated and on record with the certification board.

B. **Availability of Certified Operator(s) and Standard Operating Procedures (SOPs)**

System Category		
CWS (Community Water System)	**NTNCWS (Non-Transient Non-Community Water System**	**TNCWS (Non-Transient Non-Community Water System***

***And** serving water 60 or more consecutive days
or 120 days or more a year.

The certified operator in direct charge of treatment must demonstrate his "availability" for each shift whenever the system is producing water, and a distribution operator must always be available. Non-certified operators must use and follow specific instructions (SOPs) from the certified operator before making any process control decisions that could affect the quantity or quality of the water being delivered.

Rating:
7 pts if a certified operator in direct charge (water treatment or distribution system) cannot demonstrate "availability" at all times.
7 pts if the system does not have written treatment plant SOPs and distribution system SOPs or the back-up operator in direct charge who has been named on file for when the certified operator in direct charge is not on site and the water treatment facility or distribution system is operating.
3 pts if essential treatment plant SOPs or essential distribution system SOPs are unavailable.
1 pt if any or several SOPs are unclear, confusing, disorganized although available.

3. SOURCE (10)

These ratings will be sufficient provided the progressive point penalty is approved and used. Otherwise it will need to be revised to simply say 1 point for each item, without a limit.

A. **Adequate Supply**

System Category		
CWS (Community Water System)	**NTNCWS (Non-Transient Non-Community Water System**	**TNCWS (Non-Transient Non-Community Water System**

Impounded surface supplies must have a minimum of 30 days supply. Streams and rivers must have enough water at the 3 day-20 year low-flow to meet the maximum demand of the system. The 3 day-20 year low-flow of a spring must be able to meet the maximum demand of the system. The maximum safe yield of a well or well field must be sufficient to meet the demand of the system. Evaluation must take into account all sources available to the system. Deficiency points will **NOT** be assessed until the water system has been notified of the problem by the Division. Intake/water plant facility should be relatively free from major upstream

discharges, flooding, fires, and/or source inadequacy. Except for intake structures, the water treatment facility should not be within the 100-year flood plain. Where a facility is subject to flooding or other risks, measures should have been taken to minimize risk (berm, diversion structures, elevation of equipment). Refer to Tennessee's Design Criteria (Part 3 - Source Development) and 1200-5-1-.05(3) and 1200-5-1-.16 of the Rules.

Rating:
3 pts if source encounters periodic problems.
7 pts if any customers are without water five or more days in the year. System is not to have deficiency points deducted for inadequate pressure if an inadequate source caused low pressure.

B. **Duplicate Pumps**

System Category

CWS (Community Water System)		

And serving 50 or more connections

On all surface water, springs, or well supplies, duplicate raw water pumps equal to plant or design capacity must be provided and in working condition. A duplicate pump under repair is not to be penalized. Well fields with several wells or pumping facilities with more than two pumps are to be evaluated by removing the largest well or pump and determining if the remaining wells and/or pumps will meet the maximum demand requirement. (See Rule 1200-5-1-.17(13) and .17(17).)

Rating:
2 pts if duplicate pump not sufficient size
2 pts if broken pump has not been placed under repair
3 pts if duplicate pump not provided
1 pt If system does not have duplicate pump but maintains an emergency connection to another system or alternative means to back up system

C. **Wellhead/Springbox Construction**

Source

	True Ground Water (no filter)	True Ground Water (Iron/Manganese Filter Removal)	Ground Water Under the Influence of Surface Water (Avoiding Filtration)	Ground Water Under the Influence of Surface Water (Filtration)	

Wells and springs must be protected against the possibility of surface contamination. Well casings must extend at least 6 inches and preferably 12

inches above ground surface (ags) or above the 100-year flood, whichever is greater. Wells must be properly backfilled and capped. Vents on wells and springs must be turned down and screened, overflows on springs must be screened and protected. Vent and blow-off protection are not required for filtered supplies. (See Rule 1200-5-1-.05(3) and 17(17).) (NOTE: AWWA A100-97 requires casing extend 24 inches above ground and that the ground immediately surround the well casing slope away from the well. Also, AWWA requires the use of grout in backfilling.)

Rating:
2 pts if casing does not extend to required height
2 pts if casing is not backfilled with bentonite or cement grout
2 pts if the ground does not slope away from the well or pit does not provide for drainage

D. **Intake**

Source

Surface Water					

Surface water intake structures must be well maintained to include screens at water level, security, ventilation and general maintenance. (See Rule 1200-5-1-.5(3) and 1200-5-1-.17(17).)

Rating:
1-2 pts for maintenance deficiencies
1-2 pts if intake is not reasonably secure

E. **Source Protection Plans (or Wellhead Protection Plans, etc.)**

Source

Surface Water	True Ground Water (no filter)	True Ground Water (Iron/Manganese Filter Removal)	Ground Water Under the Influence of Surface Water (Avoiding Filtration)	Ground Water Under the Influence of Surface Water (Filtration)	

A plan must be submitted and approved by the Division for all systems using a ground water source. Surface water systems will also be required to submit a plan designating zones of protection for their source and intake. This may or should include a watershed protection plan. Ground water systems must have a Wellhead

Protection Plan (WHP). (See Rules 1200-5-1-.04(3), .04(4), .04(84), 1200-5-1-17(37), .17(38) and 1200-5-1-.34.)

Rating:
5 pts if water system does not have a Source Protection Plan or Wellhead Protection Plan (WHP).
3 pts if water system has not up-dated the plan as required.

4. TREATMENT (17)

These ratings will be sufficient provided the progressive point penalty is approved and used. Otherwise it will need to be revised to simply say 1 point for each item, without a limit.

A. **Aerator**

Source

Surface Water		**True Ground Water (Iron/Manga-nese Filter Removal)**		**Ground Water Under the Influence of Surface Water (Filtration)**	

Aerators must be functional and well maintained. Algae and amoeba form on aerators unless system pre-chlorinates; aerators must be maintained. Inspectors should check to determine if system has an adequate maintenance schedule. Aerators must not be overloaded, un-screened or unprotected. Aerators must be designed to have ability to control the amount of aeration needed. Media such as coke in aerators must be maintained. No deficiency if aerator is unscreened when followed by filtration. (See Rule 1200-5-1-.5(3) and 1200-5-1-.17(17).)

Rating:
2 pts if aerators are overloaded
3 pts if the aerator is shown not to remove CO2 to less than 20 ppm.
2 pts if coke is not maintained
2-5 pts if more than one item is not maintained

B. **Chemical Feeders**

Source

Surface Water		**True Ground Water (Iron/Manga-nese Filter Removal)**		**Ground Water Under the Influence of Surface Water (Filtration)**	

All facilities must have a sufficient number of chemical feeders to properly treat water (precluding disinfection). This may include feeders for coagulation, pH adjustment, corrosion control, fluoridation, taste and odor control, etc. A backup feeder must be available to maintain all of the steps in the coagulation process. Feeders must be in good repair, properly maintained, and not under or over-sized. Systems must use NSF (National Sanitation Foundation) or ANSI (American National Standards Institute) approved chemicals and lubricants. (See Rule 1200-5-1-.5(3) and 1200-5-1-.17(17) and (36).)

Rating: (Maximum 4 points)
5 pts insufficient number of chemical feeders
3 pts system lacks back-ups for all feeders
2 pts if a chemical feeder is in need of repair, or is under or over-sized
2 pts if any chemicals are not NSF or ANSI approved.

C. **Mixing**

Source

Surface Water		**True Ground Water (Iron/Manga-nese Filter Removal)**		**Ground Water Under the Influence of Surface Water (Filtration)**	

All systems which add chemicals must insure that proper mixing takes place during the coagulation process through mechanical mixers, static in-line mixers, or turbulence in the basin or piping. Baffling systems must work, i.e. prevent short-circuiting of water through the mixing basin. Systems which add sequestering agents, fluoride, chlorine, etc. must insure that the compounds are adequately mixed with the water prior to the first customer. (See Rule 1200-5-1-.05(3), .17(17), .17(28) and .17(29).)

Rating:
2-5 pts depending on if a system has extremely deteriorated baffles or just needs to fix a couple of baffles, etc.
2 pts if any component of the mixing process is inadequate.

D. **Flocculation**

Source

Surface Water		True Ground Water (Iron/Manga-nese Filter Removal)		Ground Water Under the Influence of Surface Water (Filtration)	

Facilities which need flocculation basins for proper floc formation must have them in place. Flocculation basin must be maintained - baffles must be in good shape and mechanical flocculators must be in working order. Flocculation basins must provide a minimum 30 minutes detention time and must not allow any short-circuiting. Flocculators must be operated as designed, e.g. variable speed flocculators must decrease in speed as the water passes into the sedimentation basins. (See Rule 1200-5-1-.5(3) and 1200-5-1-.17(17).)

Rating:
2-5 pts depending on if a system has extremely deteriorated flocculation basins, etc. or just minor repairs are needed
2-3 pts if detention time is inadequate, or flocculation not operated as designed.

E. **Sedimentation**

Source

Surface Water		True Ground Water (Iron/Manga-nese Filter Removal)		Ground Water Under the Influence of Surface Water (Filtration)	

Sedimentation basins must provide 30 minutes detention time for iron reaction, 3 hours for iron removal, and four hours for turbidity removal. Iron removal facilities that can meet the iron standard without a reaction basin will not be required to have one. Sludge must not have accumulated to the extent of impairing turbidity removal. Tube settlers must not be loaded greater than 2.5 gpm/ft^2 unless approved by the Division and must be properly maintained. Tube settlers must not be allowed to coat over with sediment and/or algae growth. Up-flow clarifiers must have a minimum detention time of 1 hour and a flow rate not to exceed 1.0 gpm/ft^2. Basins must be equipped with a drain and overflow or an alternative means must be available to drain basins. Weirs must be level to provide even flow. Basins must not be allowed to short circuit. (See Rule 1200-5-1-.5(3) and 1200-5-1-.17(17).)

Rating:
2-4 pts if any of the above is not met
5 pts if more than one of the above is not met.

F. **Filtration**

Source

Surface Water		True Ground Water (Iron/Manga-nese Filter Removal)		Ground Water Under the Influence of Surface Water (Filtration)	

Filters (including point-of-entry cartridge filters) must be maintained in good working order. All filters on surface water supplies and filtered ground water under the direct influence of surface water supplies must have loss-of-head gauges and rate-of-flow controllers in good working order. Iron removal facilities which backwash on a time schedule, cartridge filter systems and those facilities with a gain-of-head will not be required to have a loss-of-head gauge. Systems which have a declining rate filtration system will not have standard rate-of-flow controllers. All high-rate filters must be equipped with a surface wash system. The surface wash system may be located just above or below the media surface. (See Rule 1200-5-1-.5(3) and 1200-5-1-.17(17) and 1200-5-1-.17(12) for bed specification rates.)

Rating:(1-4) pts
2 pts if any of the above is not met.
5 pts if more than one of the above is not met.
11 pts if any media filters have been removed from cartridges
Overloaded filters carry an additional 3 points penalty for each 1.0 gpm/ft^2 or part thereof over the design rated capacity.

G. **Rewash (i.e. Filter-to-Waste)**

Source

Surface Water		True Ground Water (Iron/Manga-nese Filter Removal)		Ground Water Under the Influence of Surface Water (Filtration)	

All public water systems using surface water and ground water systems under the direct influence of surface water that filter must have rewash, or filter-to-waste capability or where cartridge filters are employed be capable of replacement. They should rewash, or filter-to-waste each time a filter is back-washed. The rewash procedure shall be conducted in a manner necessary to prevent the introduction of

contaminants such as pathogens and turbidity into the clear well or distribution system. Filter effluent line turbidimeters must be in good working order and read-outs must be located near backwash controls. Public water systems using **cartridge filters must replace cartridge filters (in lieu of backwash)** when the filter causes an excessive pressure drop, deficient flows, or in any way interferes with the production of water which meets standards. As an alternative, systems excluded from the rewash requirement must demonstrate that their rewash cycle is conducted in a manner to prevent the introduction of contaminants into the distribution system (Rule 1200-5-1-.17(17) and (35).

Rating:

3 pts if filter to waste not sufficient to prevent contaminants from entering the clearwell

3 pts if filter-to-waste not provided where required.

H. **Turbidimeters**

Source

Surface Water		**True Ground Water (Iron/Manga-nese Filter Removal)**	**Ground Water Under the Influence of Surface Water (Avoiding Filtration)**	**Ground Water Under the Influence of Surface Water (Filtration)**	

Recording turbidimeters with alarm and automatic shut-off capacity must be in good working order on all unmanned filter plants, springs and wells where required. Turbidimeters must be calibrated according to manufacturer's recommendations with records documenting checks and re-calibrations at least every 90 days. Comparisons of primary and secondary standards are mandatory. A calibration should be done during the survey if time allows. (See Rule 1200-5-1-.17(1) and (17).)

Rating:

7 pts if alarm and/or automatic shut-off capability requirement not met.

3 pts if calibration not performed according to manufacturer's recommendations every 90 days

I. **Disinfection**

Source

Surface Water		True Ground Water (Iron/Manga-nese Filter Removal)	Ground Water Under the Influence of Surface Water (Avoiding Filtration)	Ground Water Under the Influence of Surface Water (Filtration)	

And True Ground Water (no filter) serving 50 connections or 150 individuals.

All surface water supplies, ground water systems under the influence of surface water, and all ground water supplies (which are not purchase water systems) serving greater than 50 connections or 150 individuals must continuously chlorinate (disinfect). Unmanned CWSs and NTNCWSs which disinfect must provide duplicate disinfection equipment in good working order as required. Disinfection equipment under repair is not to be penalized. See Rule 1200-5-1-.17(11), (17) and (36).)

CWSs and NTNCWSs may be exempt from the duplicate disinfection requirement if they have a reliable continuous monitoring device with an alarm notifying a manned control center capable of preventing contaminated water from entering the system. Each component of the duplicate disinfection system must be weighed separately on different scales. Each component of the duplicate disinfection system must be operated simultaneously. At least two chlorinators must be operated at all times with each chlorinator feeding a portion of the required dosage. Chlorine residual must be checked continuously or at least every four hours for CWSs with fewer than 50 connections and NCWSs.

Systems which provide “booster” chlorination may also qualify for point deductions under section 8A, “Distribution System and Cross Connection Controls” if a 0.2 mg/l chlorine residual is not maintained.

Rating:

11 pts if disinfection is not provided where required or disinfection equipment is not working

7 pts if required chlorine residual monitoring equipment is not working and control center is unmanned

5 pts if duplicate disinfection equipment is not available

1-3 pts if two sets of scales are not available or working

J. **Disinfection Contact Time**

Source

Surface Water		**True Ground Water (Iron/Manga-nese Filter Removal)**	**Ground Water Under the Influence of Surface Water (Avoiding Filtration)**	**Ground Water Under the Influence of Surface Water (Filtration)**	

And True Ground Water (no filter) serving 50 connections or 150 individuals.

All water systems that disinfect must provide adequate contact time before the first customer. Ground water systems must provide a minimum contact time (CT) of 15 minutes and surface water and ground water under the influence of surface water systems must obtain an inactivation ratio of greater than 1.0 before the first customer. (See Rule 1200-5-1-.17(28), (29) and (30).)

Rating:

11 pts if contact time is inadequate or an inactivation ratio of greater than 1.0 is not provided. If CT time is not adequate on a routine basis, corrective action is required.

K. **Master Meter**

System Category

CWS (Community Water System)	**NTNCWS (Non-Transient Non-Community Water System**	

All water systems which must adhere to a prescribed laboratory monitoring schedule (1200-5-1-.17(2) and (3) must have a master meter to measure the amount of water treated (raw) and pumped (finished) to the system. The meter must be maintained in good working order (according to the Division's Design Criteria and 1200-5-1-.17(17)) in order to feed the correct chemical dosages with respect to the amount of water treated.

Rating:

3 pts if meter not available. No penalty if meter is under repair.

1 pt if meter is not accurate

L. **Maintenance of Equipment, Buildings and Grounds**

System Category		
CWS (Community Water System)	**NTNCWS (Non-Transient Non-Community Water System**	**TNCWS (Non-Transient Non-Community Water System**

All other equipment (in addition to turbidimeters, chlorine analyzers, pumpage meters, pumps, alarm systems, and chemical feeders) used in the treatment process must be properly maintained and in working condition. All of the buildings and grounds must be properly maintained and secured; doors to buildings should be locked, windows repaired when broken, and access gates secured. Records of maintenance, breakdowns, dates out-of-service, repairs, equipment replaced, break-ins, damage due to vandalism, theft, etc. should be kept. Adequate lighting and ventilation must be available. Dehumidifiers must be provided where needed. Air conditioners and heaters are required if temperatures are extreme or if equipment requires it. Toilet facilities are required in plants where an operator has to spend more than 4 hours per day (allowing flexibility in its operation). All buildings and equipment used in and for the production and distribution of water (to include chemical and other storage buildings) must be well maintained, have good housekeeping procedures, and be reliable and fit for the purpose of which they are used. There should be no storage of hazardous or toxic materials (including cleaning solvents and paints) in water treatment facilities (does not include storage of chemicals normally used in water treatment). Other materials should be properly stored. Drains must be provided for routing excess water. Equipment and chemicals (recliners, couches, engine repair equipment, herbicides, etc.) not used in the treatment of water should not be stored on the premises. (See Rule 1200-5-1-.17(17).)

Rating:
3-7 pts if maintenance on any significant item is neglected.
3-6 pts if maintenance on more than one significant item is neglected.
4-6 pts if significant problems with general housekeeping.

M. **Laboratory Facilities** (Used for Process Monitoring)

Source					
Surface Water		**True Ground Water (Iron/Manga-nese Filter Removal)**		**Ground Water Under the Influence of Surface Water (Filtration)**	

Water treatment plants must have all chemical, physical, and bacteriological equipment necessary to monitor and control the operation of the facility. This list of analytical equipment for surface supplies may include turbidimeter, chlorine residual analyzer, pH meter, alkalinity meter, continuous chlorine analyzer and jar

test equipment. Iron removal plants with chlorine removal must be able to monitor chlorine residual, pH, iron and chlorine. A central laboratory facility may be established to perform all of the other chemical and bacteriological parameters that may be required. The equipment must be maintained in good working order. The equipment required for each facility is based on the monitoring program established by the Division. An air conditioner and heater are required for the laboratory if temperatures are extreme for the analytical work. All Grade IV filtration plants are required to have or have access to bacteriological equipment for daily testing. The facility must have adequate space to perform required tests. The Division's Design Criteria for Community Water Systems (Part 6) should be applied. Note: In-Plant Process Monitoring Labs are not "certified" and therefore are not controlled by 1200-5-1-.14 of the Rules, however, Rule 1200-5-1-.17(3) does apply. Also, In-Plant Process Monitoring Labs must be "approved" by DWS staff.

Rating:

5 pts if any equipment is not available and needed or if system does not have a laboratory where one is needed.
3 pts if equipment is not working
2 pts for lack of adequate environmental controls for laboratory.
2 pts if lab size inadequate (generally 200 square feet).

N. **Safety**

System Category

CWS (Community Water System)	NTNCWS (Non-Transient Non-Community Water System	TNCWS (Non-Transient Non-Community Water System

All needed protective equipment must be available at the plant. All chlorine cylinders must be secured. All chlorine rooms must have an operative exhaust fan located near the floor with the switch located outside the room. Each chlorinator must be vented to the outside with screens in place on the vent lines. Incompatible compounds must not be stored together. The Division's Design Criteria for Community Water Systems (Parts 5.2-5.4) should be applied.

Rating:

1 pt if only one hazard exists.
3 pts for more than three hazards.

O. **Sludge Handling/Backwash Handling**

Source

Surface Water		True Ground Water (Iron/Manganese Filter Removal)		Ground Water Under the Influence of Surface Water (Filtration)	

All water treatment facilities with sedimentation and/or filtration should provide treatment of the sludge and/or filter backwash water prior to discharge (if the system filters-to-waste). A system which discharges treated or untreated water into a stream must have an National Pollution Discharge Elimination System (NPDES) permit. Discharges or injections to a well, or depression must have a Underground Injection Control (UIC) permit. Inspectors may check with the WPC or the Groundwater Management Section (GWMS) to determine if the system has the required permit. Facilities must have adequate sludge handling units so that the water treatment process is not jeopardized. Sludge units should be sized to allow for proper operation of the plant. (See Rule 1200-5-1-.05.)

Rating:

2-5 pts for undersized sludge units or lack of maintenance send copy of survey letter to Division of Water Pollution Control (WPC) if facility does not have either a NPDES permit or a UIC permit.

P. **Unsanitary Conditions**

System Category

CWS (Community Water System)	NTNCWS (Non-Transient Non-Community Water System	TNCWS (Non-Transient Non-Community Water System

Exceptionally poor or unsanitary conditions with potential for adverse affects on water quality must not exist on the grounds of a water treatment facility or within a facility building. There must be no evidence of pests or refuse. Water treatment facilities being renovated or expanded should be carefully inspected as on-site construction could affect water quality significantly. (See Rule 1200-5-1-.17(17).)

Rating:

2 pts for unsanitary conditions that might degrade water quality.

1-5 pts for unsanitary conditions that could have adverse effects on water quality.

Q. **Fluoridation Techniques**

System Category		
CWS (Community Water System)		

And fluoridate.

Systems which fluoridate must use proper methods and procedures. Failure to properly compute and report calculated dosages and plant effluent levels, failure to maintain fluoridation equipment, and failure to report fluoridation equipment break-downs, as well as failure to conduct periodic quality assurance sampling are examples of improper fluoridation techniques. (See Rule 1200-5-1-.06, .12, .17(20).)

Rating:
1-3 pts depending on severity of problems. Deficiency points to be assigned only after consultation with the fluoridation section.

R. **Design Capacity**

Source					
Surface Water	**True Ground Water (no filter)**	**True Ground Water (Iron/Manga-nese Filter Removal)**	**Ground Water Under the Influence of Surface Water (Avoiding Filtration)**	**Ground Water Under the Influence of Surface Water (Filtration)**	**Purchase**

Components of the water system (filter system, clearwell and storage) must meet design standards imposed by SDWA Rules (1200-5-1-.05(10), .17(12), (14) and (35) and .31).

Rating:
1-3 pts depending on the extent of storage shortage.

S. **Filter Backwash Recycling**

Source					
Surface Water				**Ground Water Under the Influence of Surface Water (Filtration)**	

By December 8, 2003, all subpart H water systems that employ conventional filtration or direct filtration and recycle spent filter backwash water, thickener supernatant, or liquids from dewatering processes, must provide to the State a plant schematic showing the origin of all flows which are recycled, hydraulic conveyances used to transport them and other required information on recycle flows. (Rule 1200-5-1-.31(9)).

Rating:
3 pts for failing to provide a plant schematic showing the origin of all flows which are recycled, hydraulic conveyances used to transport them and other required information on recycle flows.
1 pt each for failing to maintain records: listing all recycle flows and their frequency; average and maximum backwash flow rates and duration of filter backwash process; typical filter run length and summary; type of treatment provided for recycle flow; and data on treatment units, loads and chemicals used.

5. MONITORING, REPORTING AND DATA VERIFICATION (20)

A. Laboratory - Process Monitoring

Source

Surface Water		**True Ground Water (Iron/Manga-nese Filter Removal)**		**Ground Water Under the Influence of Surface Water (Filtration)**	

All water treatment facilities must monitor their water treatment process in accordance with the monitoring program established (1200-5-1-.12 and .17 (3)) for the system and tests must be performed according to established procedures. Consideration will be given for monitoring equipment under repair. Improper Reporting of Data (includes negligence, mis-communication of information or data, poor record-keeping, falsification, etc.) must be investigated. Data should be reviewed and compared to validate reported information. This may be accomplished by comparison of Monthly Operation Reports, summary forms, and system on-site records. All water facilities with a surface supply must have an operator in attendance* while treating water. All ground water sources with gravity filters must have an operator in attendance unless waived by the DWS.

* "In attendance" means on-site personnel who have a reasonable knowledge of water quality and plant operations

Rating:
11 pts if operator not in attendance when required.

2 pts for failure to meet one monitoring requirement; 4 points for failure to meet more than one requirement.
3 pts for failure to perform tests according to established procedures.
11 pts falsification of reports or data
7 pts for turbidimeter calibration records missing or unavailable
11 pts if operator is not able to perform operational tests

B. **Turbidity Monitoring**

Source					
Surface Water		**True Ground Water (Iron/Manga-nese Filter Removal)**	**Ground Water Under the Influence of Surface Water (Avoiding Filtration)**	**Ground Water Under the Influence of Surface Water (Filtration)**	

And ground water systems serving 50 connections or more or 150 individuals or more.

Public water systems having a true ground water source are not required to monitor for turbidity unless they have been directed by the DWS to do so. (See Rule 1200-5-1-.05(11).)

Surface water systems and ground water systems under the direct influence of surface water (whether they filter, meet the criteria for avoiding filtration or do not filter) must submit monthly turbidity data on the MOR and the **Turbidity Summary Form**. All public water systems using surface water and ground water systems under the direct influence of surface water that filter (except those utilizing **cartridge filters**) should perform a rewash cycle, or filter-to-waste each time a filter is back-washed unless an alternative has been approved. Systems must backwash a filter to prevent the individual filter from exceeding the MCL. Systems must also filter-to-waste or take other corrective action until such time as filter effluent meets turbidity standards (i.e. filtering-to-waste while monitoring the individual filter turbidimeter until water meets the acceptable turbidity level).

Public water systems having a ground water source under the direct influence of surface water and do not filter and have qualified to avoid filtration must monitor turbidity every four hours (or more frequently) that the system produces water. The system may substitute continuous turbidity monitoring for grab sample monitoring. The system must report the maximum turbidity level measured each day during the month, date(s) of occurrence of values exceeded 5 NTU, and the cumulative number of events turbidity exceeded 5 NTU in the previous 12 months and previous 120 months. **Subpart H systems** meeting criteria for avoiding filtration must comply with the 5 NTU maximum (no single sample can exceed this value) (See Rule 1200-5-1-31(2).)

Surface water systems and **ground water systems under the direct influence of surface water and required to install filters (but as of yet do not have**

them) are required to monitor turbidity once every four hours. If more than one value is obtained every four hours the **highest value** must be reported. Turbidity compliance for public water systems with a ground water source under the direct influence of surface water (Rule 1200-5-1-.08 applies to systems with sources that are ground water and under the influence of surface water) is determined from data submitted monthly on a **Turbidity Summary Form** and the Monthly Operation Report (MOR). Turbidity summary sheets must be received in the Nashville Central Office by the 10th of the following month. Likewise MORs must be received in the EAC by the 10th of the month. Laboratories performing the turbidity analysis must be "approved" by the DWS. All CWSs with ground water supplies serving 50 connections or 150 individuals except those in approved sand and gravel formations or those with a waiver are required to have an in-line turbidimeter with recorder and automatic shut-off capability (1200-5-1-.05(11)).

Subpart H systems with conventional, diatomaceous earth or direct filtration that are required to monitor turbidity must take measurements every four hours (within a twenty-four hour period a system must have 6 measurements). Measurements may be more frequent than every four hours. According to DWS guidance (13 May 1993) water systems that elect to take more than one turbidity sample during one of the six time segments are required to report the highest detected turbidity determined during the four hour segment. Systems with slow sand filtration or filtration treatment other than conventional treatment and systems serving fewer than 500 persons regardless of the type of filtration used may reduce the sampling frequency to one per day if less frequent monitoring is sufficient to indicate effective filtration performance.

Until January 2005 Subpart H systems (surface water systems and ground water systems under the direct influence of surface water with filtration) serving fewer than 10,000 persons, must comply with the 0.5 NTU maximum in 95 percent of all combined filter effluent samples taken during the period (See Rule 1200-5-1-.31(2) and (4)) and 5 NTU (no single sample can exceed this maximum).

Beginning January 14, 2005, Subpart H systems serving fewer than 10,000 persons must comply with the 1 NTU maximum (combined filter effluent) and a maximum of 0.3 NTU in 95 percent of all combined filter effluent samples collected each month. Also, systems must monitor individual filters. Individual filter turbidity levels cannot exceed 1.0 NTU in two consecutive measurements taken 15 minutes apart; nor can individual filters exceed 0.5 NTU in two consecutive measurements taken 15 minutes apart at the end of the first four hours of operation after a backwash; nor can individual filter turbidity levels exceed 1.0 NTU in two consecutive measurements taken 15 minutes apart in three consecutive months; nor can individual filters exceed 1.0 NTU in two consecutive measurements 15 minutes apart in two consecutive months. If an individual filter exceeds any of the above limits, a filter profile and special report to the state is required. A turbidity level above 2.0 NTU requires a comprehensive performance evaluation (CPE) by an outside consultant.

Subpart H systems (after January 1, 2002) serving 10,000 or more persons, must comply with the 1 NTU maximum (combined filter effluent) and a maximum of 0.3 NTU in 95 percent of all combined filter effluent samples collected each month. Also, systems must monitor and read individual filters. Individual filter turbidity

levels cannot exceed 1.0 NTU in two consecutive measurements taken 15 minutes apart; nor can individual filters exceed .5 NTU in two consecutive measurements taken 15 minutes apart at the end of the first four hours of operation after a backwash; nor can individual filter turbidity levels exceed 1.0 NTU in two consecutive measurements taken 15 minutes apart in three consecutive months; nor can individual filters exceed 1.0 NTU in two consecutive measurements 15 minutes apart in two consecutive months. If an individual filters exceeds any of the above limits, a filter profile and special report to the state is required. A turbidity level above 2.0 NTU for an individual filter requires a comprehensive performance evaluation (CPE) by an outside consultant.

Public water systems using cartridge filters must replace cartridge filters when filter effluents approach 0.5 NTU: DWS guidance (Jan 2000) categorizes NCWSs using absolute 1.0-micron cartridge filter systems as Point of Entry (POE) systems; these systems shall monitor and record finished water turbidity at least once per month. Systems which have difficulty complying with the 1.0 NTU turbidity limit must consider more frequent monitoring.

Rating:
Late reports:
2 pt for each late Turbidity Summary Form received between the 11th and the last day of the month.
5 pts for four or more reports submitted late.

Non-submittal of Turbidity Summary Reports:
2 pts if reports not submitted or reports received after last day of month.
5 pts for failure to monitor and report turbidity results as required for one month.
8 pts for two reports not submitted.
11 pts for three or more reports not submitted

Improper Monitoring and Record Keeping:
6 pts for failure to take turbidity repeat samples as required (each reoccurrence).
7 pts for failure to “backwash” and/or “filter-to-waste” or install new cartridge filter as required.

C. **Chlorine Residual Monitoring**

Population Served

25 - 3,300 population		

Subpart H systems (surface water source or ground water source under the influence of surface water – whether or not providing filtration treatment) serving less than 3,300 or fewer people must take grab samples according to frequencies prescribed by rule 1200-5-1-.31(5)(b) and (c) and report the **lowest value** each day. Larger systems may monitor by taking a grab sample every 4 hours for no more than 5 days in the event of equipment failure.

Continuous Chlorine Residual Monitoring

Population Served

	3,300 – 10,000 population	10,000 or more population

Subpart H systems (surface water source or ground water source under the influence of surface water – whether or not providing filtration treatment) serving more than 3,300 people must monitor chlorine entering system continuously and report the **lowest value** each day. Systems may monitor by taking a grab sample every 4 hours for no more than 5 days in the event of equipment failure. (See Rules 1200-5-1-.31(5)(b) and 1200-5-1-.31(5)(c).)

Rating:

3 pts if chlorine not monitored as required as evidenced by either working equipment or records.

2 pts if equipment not returned to service within 5 days but no more than 10 days.

2 pts if records and working equipment are available but discrepancies exist and/or records are incomplete.

D. **Primary Chemicals (Inorganic Chemicals, Volatile Organic Chemicals, Synthetic Organic Chemicals, Radionuclides, Nitrate, Sodium, Trihalomethanes, and HAA5)**

System Category

CWS (Community Water System)	NTNCWS (Non-Transient Non-Community Water System	TNCWS (Non-Transient Non-Community Water System

All public water systems must monitor the primary chemicals in accordance with the Division's regulations. All samples must be collected in accordance with the monitoring requirements. If confirmation samples are required they must be collected within the time period specified by the regulations. All analysis must be made by a State Certified Laboratory and completed by the due dates.

Rating:

7 pts if system fails to meet any of the regular monitoring requirements except trihalomethane (THM) by the required date and the system is not more than 6 months late in submitting the sample to a certified laboratory.

7 pts if a system required to sample trihalomethanes, HAA5, volatile organic chemicals, or synthetic organic chemicals fails to monitor for one quarter.

5 pts if system fails to meet confirmation or repeat sampling requirements or VOC confirmation samples as specified.

7 pts if system fails to collect sample from acceptable location.

5 pts if system required to sample and fails to monitor of sodium

E. **Secondary Chemicals**

System Category

CWS (Community Water System)		

And NCWSs deemed necessary

All community water systems (CWS) and non-community water systems (NCWSs) as deemed necessary must collect a sample from the distribution system in accordance with the established time schedule for secondary chemical analysis. (See Rule 1200-5-1-.04.) All analysis must be performed by State Certified or State "Approved" laboratory.

Rating:
5 pts if a CWS system fails to monitor for secondary chemicals as required.
3 pts if a NCWS system fails to monitor for secondary chemicals as required.

F. **Bacteriological** (Distribution System)

System Category

CWS (Community Water System)	NTNCWS (Non-Transient Non-Community Water System	TNCWS (Non-Transient Non-Community Water System

All CWSs must collect a minimum number of samples from the distribution system each month. The minimum number of samples required is based on the population served by the system, but may be elevated ("elevated routine" samples) during a month following positive samples, depending on population served. The water system must meet all repeat sampling requirements. Samples must be collected from valid distribution locations using an acceptable sample site plan. Systems which are certified to analyze bacteriological samples must submit the bacteriological summary sheet to the Nashville Central Office (NCO) by the 10th of the FOLLOWING month. Systems which analyze bacteriological samples for other systems must submit results to the Nashville Central Office and the appropriate EAC each month. Summary forms received after the 10th of the following month may be counted as a monitoring violation. The penalty for a bacteriological monitoring violation will be lowered if the system makes a reasonable attempt to monitor by submitting at least one valid sample. If the system can demonstrate it has met the Contact Time (CT) value and has acceptable NTU values the points deduction shall be one-half of the deduction earned. All Public Water Systems (PWS) must develop and utilize a **bacteriological sampling plan** that takes into account the entire distribution system to insure that all areas of the system are monitored, with samples taken throughout the compliance period. The Bacteriological Site Sampling Plan is required by 1200-5-1-.07(1)). The plan should address the number and location of follow-up sampling (repeat and elevated routine), and instructions relative to public notification. In addition, the plan should

also provide information on sample collection technique, coding of bacteriological slips, record keeping, etc.

PWSs that conduct their own bacteriological analysis must also collect **quality assurance** samples (coded "Q" as Quality Assurance samples) for submittal to the State Laboratory. Quality assurance samples should be collected in accordance with the system's bacteriological sampling plan and are counted toward compliance.

All PWSs making repairs to water mains must collect bacteriological samples if the main is de-watered or partially de-watered (Rule 1200-5-1-.17(8)).

Rating:

Non-submittal of Routine Samples

11 pts if system fails to submit <u>any</u> valid samples during a one month monitoring period.

7 pts If the water system fails to submit the required number of valid samples during a one month monitoring period. Reduce the points if the system can demonstrate that CT and treatment technique requirements for turbidity were met.

Partial Monitoring (submission of at least 50% of the required valid samples)

3 pts if sampling requirement only partially met during one month.

7 pts if sampling requirement only partially met during two months.

11 pts if sampling requirement only partially met three or more months. Provided system was notified after second partial monitoring

Late Summary Forms - for certified bacteriological labs.

1 pt for report received after 11th of month.

3 pts for two late reports.

5 pts for three late reports.

Four or more reports submitted late may be counted as a non-submittal violation.

Repeat and Elevated Routine Samples

6 pts if system fails to take valid repeat or elevated routine samples required.

11 pts for two or more repeat or elevated routine sample violations.

Sampling Plan

10 4 pts - if system is a CWS and does not have a written sampling plan

3 pts - if plan is inadequate

Line Repair Samples

5 pts if system fails to collect valid samples for line repairs where required

10 pts for two or more line repair sample violations

G. **Lead and Copper Monitoring**

System Category

CWS (Community Water System)	NTNCWS (Non-Transient Non-Community Water System	

All CWSs and NTNCWSs must monitor for lead and copper according to regulation 1200-5-1-.33 based on population. Proper documentation must be submitted each monitoring period, including sample site identification and sample site summary form. When exceedance of the lead and copper action level have occurred systems must monitor for water quality parameters (WQP) and source water quality. Also, systems serving 50,000 or more people must monitor source water quality parameters. After additional testing has been completed an Optimal Corrosion Control Treatment Recommendation (OCCTR) must be submitted to the Division. Monitoring and submission of required documentation must be completed in a timely manner. Consecutive water systems, including apartment complexes may "consolidate" for the purpose of complying with this requirement. A written "consolidation" agreement must be signed by officials of the parent system and approved by the DWS.

Selective consecutive systems may not be required to have "consolidation" agreements if they have provided the DWS with a construction material survey which demonstrates that the consecutive system has no higher risk sampling sites than the parent system, turnover of the water within the system enables corrosion inhibitors to be effective, the consecutive system is an apartment or condominium complex and agrees to conduct public education and/or issue notices should the parent system fail to comply with applicable regulations and there is no other evidence that the consecutive system's customers are at a higher risk to lead and copper exposure than the parent system's customers. Consecutive systems without a written consolidation agreement can only use the parent system's lead and copper results if approved in writing by the state.

Rating:

3 pts if not more than 3 months late (DWS does not accept samples any later than this)
2 pts for late WQP (Water Quality Parameter) samples or source water samples.
3 pts for failure to collect WQP samples or source water samples.
3 pts for failure to have a monitoring agreement with parent system
6 pts if system fails to monitor
4 pts if system fails to submit optimal corrosion control treatment (OCCT) plan
3 pts for late OCCTR.

H. **Disinfection/Disinfection By-Products Monitoring**

System Category		
CWS (Community Water System)	**NTNCWS (Non-Transient Non-Community Water System**	

Water system (CWSs and NTNCWSs) must monitor for disinfection by-products and MRDLs for Disinfectants.

Rating:

2-5 pts if water system fails to monitor for any disinfectant or disinfection by-product as required.

2-5 pts if water system fails to maintain continuous monitoring of turbidity for each individual filter or conduct grab sampling as required.

2-5 pts if water system fails to report required MCL and/or MRDL data in a timely manner.

I. **Turbidity Compliance**

Source					
Surface Water	**True Ground Water (no filter)**	**True Ground Water (Iron/Manganese Filter Removal)**	**Ground Water Under the Influence of Surface Water (Avoiding Filtration)**	**Ground Water Under the Influence of Surface Water (Filtration)**	

Inspectors should review current daily work sheets, instrument scales, etc. Sheets should be labeled to show current time, date and scale for which data is being collected (the date should not be the "shift" date). Inspectors should also review and compare previously submitted records (MORs, and Summary Data) with recorded turbidity chart data, daily work logs, etc. Previously submitted MORs and other reports should compare and be consistent with system strip charts and daily worksheets. The inspector should check to insure backwashes/filter to waste events are noted on strip charts. The strip charts should be labeled with date, time, place, operating scale for each day, actions taken and operator initials. Spikes in turbidity, omissions in data, discrepancies and anomalies should be investigated and where warranted filter profiles conducted. All records should be available at the time of the survey.

Public water systems having a true ground water source are not required to monitor for turbidity unless they have been directed by the DWS to do so. (See Rule 1200-5-1-.05(11).)

Public water systems having a ground water source under the direct influence of surface water and have qualified to avoid filtration must monitor

turbidity every four hours (or more frequently) that the system produces water. The system may substitute continuous turbidity monitoring for grab sample monitoring. The system must report the maximum turbidity level measured each day during the month, date(s) of occurrence of values that exceed 5 NTU, and the cumulative number of events that turbidity exceeded 5 NTU in the previous 12 months and previous 120 months. **Subpart H systems** (surface water systems and ground water systems under the direct influence of surface water) meeting criteria for avoiding filtration must comply with the 5 NTU maximum (no single sample can exceed this value) (See Rule 1200-5-1-.31(2).)

Surface water systems and ground water systems under the direct influence of surface water and required to install filters but as of yet do not are required to monitor turbidity once every four hours. If more than one value is obtained every four hours the **highest value** must be reported. Turbidity compliance for public water systems with a ground water source under the direct influence of surface water (Rule 1200-5-1-.08 applies to systems with sources that are ground water and under the influence of surface water) is determined from data submitted on the **Turbidity Summary Form** and the Monthly Operation Report (MOR). Applicable systems must monitor turbidity once each day the plant is operated. A repeat sample must be taken any time the turbidity is greater than 1 Nephelometric Turbidity Units (NTU). Turbidity summary sheets must be received in the Nashville Central Office by the 10th of the following month. Likewise MORs must be received in the EAC by the 10th of the month. Laboratories performing the turbidity analysis must be "approved" by the DWS. All CWSs with ground water supplies serving 50 connections or 150 individuals so designated in writing are required to have an in-line turbidimeter with recorder and automatic shut-off capability (1200-5-1-.05(11)).

Subpart H systems with conventional, diatomaceous earth or direct filtration that are required to monitor turbidity must take measurements every four hours (within a twenty-four hour period a system must have 6 measurements). Measurements may be more frequent than every four hours. According to DWS procedure (13 May 1993) water systems that elect to take more than one turbidity sample during one of the six time segments are required to report the highest detected turbidity determined during the four hour segment. Systems with slow sand filtration or filtration treatment other than conventional treatment and systems serving fewer than 500 persons regardless of the type of filtration used may reduce the sampling frequency to one per day if less frequent monitoring is sufficient to indicate effective filtration performance.

Until January 2005 Subpart H systems (surface water systems and ground water systems under the direct influence of surface water with filtration) serving fewer than 10,000 persons, must comply with the 0.5 NTU maximum in 95 percent of all combined filter effluent samples taken during the period (See Rule 1200-5-1-.31(2) and (4)) and 5 NTU (no single sample can exceed this maximum).

Beginning January 14, 2005, Subpart H systems serving fewer than 10,000 persons must comply with the 1 NTU maximum (combined filter effluent) and a maximum of 0.3 NTU in 95 percent of all combined filter effluent samples collected each month. Also, systems must monitor individual filters. Individual filter turbidity levels cannot exceed 1.0 NTU in two consecutive measurements taken 15 minutes

apart; nor can individual filters exceed 0.5 NTU in two consecutive measurements taken 15 minutes apart at the end of the first four hours of operation after a backwash; nor can individual filter turbidity levels exceed 1.0 NTU in two consecutive measurements taken 15 minutes apart in three consecutive months; nor can individual filters exceed 1.0 NTU in two consecutive measurements 15 minutes apart in two consecutive months. If an individual filter exceeds any of the above limits, a filter profile and special report to the state is required. A turbidity level above 2.0 NTU requires a comprehensive performance evaluation (CPE) by an outside consultant be conducted.

Subpart H systems (after January 1, 2002) serving 10,000 or more persons, must comply with the 1 NTU maximum (combined filter effluent) and a maximum of 0.3 NTU in 95 percent of all combined filter effluent samples collected each month. Also, systems must monitor and read individual filters. Individual filter turbidity levels cannot exceed 1.0 NTU in two consecutive measurements taken 15 minutes apart; nor can individual filters exceed .5 NTU in two consecutive measurements taken 15 minutes apart at the end of the first four hours of operation after a backwash; nor can individual filter turbidity levels exceed 1.0 NTU in two consecutive measurements taken 15 minutes apart in three consecutive months; nor can individual filters exceed 1.0 NTU in two consecutive measurements 15 minutes apart in two consecutive months. If an individual filters exceeds any of the above limits, a filter profile and special report to the state is required. A turbidity level above 2.0 NTU for an individual filter requires a comprehensive performance evaluation (CPE) by an outside consultant be conducted.

Public water systems using cartridge filters must replace cartridge filters when the filter effluent approach 0.5 NTU unless an alternative standard has been approved. DWS guidance (Jan 2000) categorizes NCWSs using absolute 1.0-micron cartridge filter systems as Point of Entry (POE) systems; these systems shall monitor and record finished water turbidity at least once per month. Systems which have difficulty complying with the 1.0 NTU turbidity limit must consider more frequent monitoring.

Rating:

7 pts if system is in violation for 1 month in the last 12 months.

11 pts if system is in violation for more than one month in the past 12 months. Consideration should be given if system is meeting an established agreed upon time schedule for coming into compliance.

9 pts penalty if in violation for two or more months, but meeting established time schedule for compliance.

J. **Primary Chemical Compliance**

System Category

CWS (Community Water System)	NTNCWS (Non-Transient Non-Community Water System	TNCWS (Non-Transient Non-Community Water System

All water systems must meet the maximum contaminant levels (MCLs) for the primary chemicals (Inorganics, Organics, Radionuclides, "Regulated" VOCs, Trihalomethanes, HAA5) based on the regulations. (See Rules 1200-5-1-.09, 1200-5-1-.10, 1200-5-1-.11, 1200-5-1-.22, 1200-5-1-.24, 1200-5-1-.25, 1200-5-1-.28, and 1200-5-1-.36)

Rating:

3 pts for failure to comply with the MCL. An additional 3 points for every three months the system has failed to initiate steps to correct the problem.

6 pts if system required to monitor TTHM and HAA5 has two violations in a twelve month period.

11 pts if system does not take steps to correct problem after two violations.

K. Secondary Chemical Compliance

System Category

CWS (Community Water System)	NTNCWS (Non-Transient Non-Community Water System	TNCWS (Non-Transient Non-Community Water System

All water systems will be penalized for failure to meet the secondary chemical MCLs through routine monitoring if exceedance causes problems. (See 1200-5-1-.12.)

Rating:

3 pts if failure to meet secondary standards causes problems (complaints).
An additional 3 points if system does not take steps to correct the problem.

L. Bacteriological Compliance

System Category

CWS (Community Water System)	NTNCWS (Non-Transient Non-Community Water System	TNCWS (Non-Transient Non-Community Water System

Systems collecting fewer than 40 routine distribution samples per sampling period can have no more than one positive sample. Systems collecting 40 or more routine distribution samples per sampling period can have no greater than 5% of the samples positive. A violation can also be triggered by a fecal coliform or E-Coli positive repeat sample or fecal coliform or E-coli-positive routine sample as specified under regulation 1200-5-1-.06(4). Systems encountering a positive distribution system sample, which is later determined to be an internal plumbing problem, must document the cause of the problem before the sample can be considered for invalidation.

Rating:
5 pts if system receives a non-acute violation
9 pts if system receives an acute (any one sample fecal or E-Coli positive) violation
11 pts if system is in violation for two months in the past 12 months.
17 pts if system is in violation three or more months in the past 12 months.

M. **Lead and Copper Action Level Compliance**

System Category

CWS (Community Water System)	NTNCWS (Non-Transient Non-Community Water System	

All CWSs and NTNCWSs must meet lead and copper action levels. If testing shows exceedances of the action level for either parameter corrective measures must be taken to insure the quality of the water such as an optimal corrosion control plan and water quality parameters testing. (See Rule 1200-5-1-.33.)

Rating:
7 pts if the lead and copper action levels are exceeded and the system takes no measures to meet the action levels
3 pts + 3 pts every 6 months system fails to take corrective measures
6 pts if system fails to maintain OCCT as required by rule

No points will be assessed against a system if it uses an inhibitor that proves to be effective or has documentation through the use of coupons or other means that the water is not aggressive to the materials used in the distribution system.

N. **Disinfection/Disinfection By-Products Compliance**

System Category

CWS (Community Water System)	NTNCWS (Non-Transient Non-Community Water System	

Water system (CWSs and NTNCWSs) must meet MCLs for disinfection by-products and MRDLs for Disinfectants. If testing shows exceedances of these levels for any disinfectant or disinfection by-product corrective measures must be taken to insure the quality of the water meets established standards. (See Rule 1200-5-1-.36.)

Rating:
5 pts if water system fails to meet MRDLs for disinfectants.
5 pts if water system fails to meet MCLs for disinfection by-products.
5 pts if water system fails to report required MCL and/or MRDL data in a timely manner.

5 pts if water system fails to operate with enhanced coagulation or enhanced softening to achieve TOC removal levels, or otherwise meets alternative compliance criteria (Rule 1200-5-1-.36(9)).

6. FINISHED WATER STORAGE (10)

A. Adequate Storage

System Category

CWS (Community Water System)	NTNCWS (Non-Transient Non-Community Water System	

And serving 50 or more connections.

A water system must be able to provide 24 hours of gravity storage based on the yearly average demand. Special consideration may be given to systems with high seasonal demand. Those systems must have 24 hours of storage based on the average demand during the peak continuous four month period. Storage must be located so that the demand at any time can be met in all areas of the system. Systems which purchase water for resale may utilize the storage of the supplier provided the supplier has adequate storage capable of delivery in an emergency to the purchaser. Suppliers that are not willing to provide storage for a purchaser of water will be considered to have adequate storage if they have enough storage available to meet their own demand. Credit is to be given to water systems that have large ground storage tanks provided auxiliary power is available to pump water to the distribution system. Systems, which have multiple treatment facilities (more than 3), have more than one source of water and which have special power arrangements so that it is unlikely that all treatment units would be down at the same time, may not be required to have distribution storage provided the system can meet peak demands. (See Rule 1200-5-1-.17(14).)

Water systems which have an average daily demand of 10 million gallons (MGD) or more will not be required to have 24 hours of distribution storage provided the system has adopted an Emergency Operations Plan (EOP) which specifically addresses such emergencies. The EOP must enable the water system to provide service to all essential customers such as residential, hospitals, nursing homes, etc. for a 24-hour period during any type of emergency involving the shut down of the treatment facilities. Credit for an EOP will be given after the Division of Water Supply has approved the plan.

Rating:

3 pts if system has less than 24 hours of storage but more than 20 hours based on average demand

5 pts if system has less than 20 hours of storage but more than 12 hours based on average demand.

7 pts if system has less than 12 hours of storage based on average demand.

5 pts if system storage is not located in a manner to meet the instantaneous demand on the system.

B. **Inspection and Maintenance of Reservoirs, Tanks and Clearwell**

System Category

CWS (Community Water System)	NTNCWS (Non-Transient Non-Community Water System	TNCWS (Non-Transient Non-Community Water System

All reservoirs, tanks, and clearwells must be properly maintained and secured. Excessive rust should not be present. All vents and overflows should be properly screened and flappers in place and functional. Overflows must discharge above grade. Tank level indicators should work correctly. Altitude valve, if installed, should be in good working order. Altitude valve pits must have drains to remove excess water, all drains must be properly screened to prevent clogging. (Note: the screen should be placed at the head of the drain pipe inside the pit, otherwise leaves, etc. will enter the pipe and clog at the outlet side of the drain pipe). All access hatches should be locked to prevent unauthorized entry and contamination. Access should be further limited at tank sites subject to vandalism. If vandalism is apparent, (or records indicate a pattern of trespass, vandalism or break-ins) security measures must be taken i.e. fences, locked gates, detection, surveillance, and alarm devices, etc. must be obtained. Hatches designed to prevent surface contamination should be installed on each tank. The system should have periodic tank inspections to assess tank integrity and maintain such records. (Rules 1200-5-1-.17(16), (17), (33) and (34).)

Rating:
3 pts for each item not met (up to 7 pts total)
3 pts for failure to have professional independent five year tank inspections conducted.

7. PUMPS, PUMP FACILITIES AND CONTROLS (3)

A. **Pump Stations**

System Category

CWS (Community Water System)		

And serving 50 or more connections.

All pump stations must be equipped with duplicate pumps or have a stand-by pump that can be installed in an hour in a small pump station (50 gpm or less). Pump stations with more than two pumps must be capable of meeting the demand with the largest pump removed from service. Pump stations must have a low suction cut off device or an alarm so that the pump station can be shut down immediately. A pressure sustaining valve may be used in lieu of automatic shutoff device. Pump stations supplying a tank or reservoir may be approved for only one pump, but

pressure sustaining stations must be equipped with duplicate pumps. (See Rule 1200-5-1-.17(13) and (9).)

Rating:
3 pts if duplicate pumps are not installed or available if station pumps 50 gpm or less.
2 pts for lack of low suction cut off device.
2 pts if second pump is insufficient size. 1 pt if pump capable of meeting average daily pumpage.
3 pts for each location not providing duplicate pumps where required.
3 pts if pumping capacity is inadequate to meet plant capacity after removing the largest pump.

B. **Maintenance of Pumping Equipment**

System Category

CWS (Community Water System)		

All pump stations and pumps must be secured and properly maintained. Pumps and duplicate pumps must be in good working order or under repair. Pumps under repair are not to be penalized. (See Rule 1200-5-1-.17(17).)

Rating:
3 pts if broken pump is not under repair.
2 pts if pump is leaking or vibrating excessively
2 pts if pump stations are not properly secured

8. DISTRIBUTION AND CROSS CONNECTIONS (14)

A. **Chlorine Residual**

Source

Surface Water		**True Ground Water (Iron/Manga-nese Filter Removal)**	**Ground Water Under the Influence of Surface Water (Avoiding Filtration)**	**Ground Water Under the Influence of Surface Water (Filtration)**	**Purchase**

And True Ground Water serving 50 connections or 150 individuals.

All systems using chlorine as a disinfecting agent must operate the system in a manner to maintain a minimum free chlorine residual of 0.2 mg/L in the distribution system (in 95% of the samples collected each month). Accordingly, booster chlorination stations must be well maintained and in good operating order. A

system approved for any other disinfecting agent must meet the residual established by the Division for that agent. All test procedures must be in accordance with the latest edition of "Standard Methods." Penalties for lack of chlorine residual are assessed after testing by Division personnel at multiple locations (more than three) in the distribution system. (See Rule 1200-5-1-.17(4).)

Rating:

5 pts if some free chlorine residual is available but is below 0.2 mg/L in more than 5% of the samples in any month.

9 pts with no residual for any one day.

B. **Notification, Inspection and Disinfection of New or Existing Facilities**

System Category

CWS (Community Water System)	NTNCWS (Non-Transient Non-Community Water System	TNCWS (Non-Transient Non-Community Water System

All water systems must disinfect new facilities prior to placing them into service. Emergency repairs must be disinfected and flushed prior to placing into service. Systems shall retain records of chlorine residual and bacteriological results on new lines and repair work that involves de-watering of lines or facilities for 5 years. Records must include location or project name, size and type of main, date and time, repair procedure utilized, chlorine concentration used, time of saturation, duration of flushing, final chlorine residual, etc. (See Rule 1200-5-1-.17(8).)

Rating:

3 pts each occasion (9 points maximum) if system does not properly flush, disinfect, and submit a bacteriological sample to a certified laboratory for new lines prior to placing them into service. Line replacement and emergency repair records should show lines flushed, disinfected, and bacteriological sample taken to confirm results. All bacteriological samples must be analyzed by a state certified laboratory.

C. **Flushing Program**

System Category

CWS (Community Water System)		

All community water systems with 50 connections or more must have a routine flushing program which assures acceptable water quality for all areas of the distribution system. (See Rule 1200-5-1-.17(10) and (32).) The system must utilize its distribution map locating its dead-ends and other low use areas to develop a flushing program. Flushing records are to be maintained by the water system. These records are to include the portion of system flushed, date of

flushing, length of time the line is flushed, and beginning and ending chlorine residual. Records shall be maintained at least until the next sanitary survey is conducted. Flushing should be planned to prevent customer complaints and water quality problems.

Rating:

5 pts if water system does not have flushing program with records.

3 pts if lack of flushing in a localized area causes water quality problems such as taste and odor, red water, inadequate chlorine residual, etc.

5 pts if lack of flushing in two or three areas of the system causes water quality problems such as taste and odor, red water, inadequate chlorine residual, etc.

7 pts if lack of flushing in a localized area repeatedly causes water quality problems

7 pts if red water problems have caused major customer dissatisfaction as evidenced by public meetings, lawsuits or an unusually large number or concentration of complaints. These points can only be taken on the plant or distribution system, but not both.

D. **Fire Hydrants**

System Category

CWS (Community Water System)		

Fire hydrants shall not be installed on water mains less than six inches in diameter. Fire hydrants are prohibited on all water mains that cannot produce 500 gpm at 20 pounds per square inch (PSI) residual pressure unless specific approval (1200-5-1-.17(18)) is obtained from the Department. In order to be approved the DWS must have in its files an adopted ordinance or policy and signed statements from all fire departments in the area on the use of color coded hydrants.

Rating:

5 pts for installing fire hydrants on mains less than 6 inches in diameter and/or that cannot provide 500 gpm at 20 pounds per square inch (PSI) residual pressure, without prior approval from the Department.

3 pts deduction for hydrants which are not properly color coded.

E. **Adequate Pressure**

System Category		
CWS (Community Water System)		

All CWSs must be operated to provide a minimum pressure of 20 psi at each meter throughout the system. (See Rule 1200-5-1-.17(9).)

Systems should not be penalized in this category for pressure problems caused by a source deficiency.

Rating:

5 pts if system is unable to maintain 20 psi water pressure to all customers.

11 pts if system has an area where there is zero pressure under normal conditions. Consideration is given for line breaks and other emergency situations. Penalty will be reduced if system has taken corrective action to immediately address the problem and response includes having plans approved and awarding contract for a project which will solve the pressure problem.

F. **Valves and Blow-Offs**

System Category		
CWS (Community Water System)	NTNCWS (Non-Transient Non-Community Water System	TNCWS (Non-Transient Non-Community Water System

All CWSs must be adequately valved with blow-offs or flush hydrants provided in appropriate areas. All dead end lines must have provisions to flush the mains. A system cannot use a customer's individual connection as a primary means to flush a main. Flushing mechanisms must allow a velocity of 2 ft/sec. (See Rule 1200-5-1-.17(23).)

Rating:

2 pts if system does not a blow-off or hydrant on a dead-end line.

2-5 pts if system does not have blow-offs or hydrants in all areas.

3 pts if lack of valves or blow-offs cause problems with lack of chlorine residual, customer complaints, taste and odor problems, discoloration, etc.

G. **Map of Distribution System**

System Category		
CWS (Community Water System)		

All CWSs must have up-to-date maps of the distribution system showing location of valves, blow-offs, fire hydrants, air release valves, storage tanks, pumping stations, etc. Maps should be updated when the distribution system has significant additions or completely up-dated every five years. (See Rule 1200-5-1-.17(15).)

Rating:
5 pts for not having map(s) of the system.
3 pt for not maintaining up-to-date map(s).

H. **Approved Cross connection Policy or Ordinance**

System Category		
CWS (Community Water System)		

All municipal water systems are required to adopt an ordinance prohibiting cross connections. All utility districts, water co-ops, private water systems including apartment complexes, etc., are required to adopt a policy prohibiting cross connections. (See Rule 1200-5-1-.17(6).)

Rating:
11 pts if a water system fails to adopt a cross connection ordinance or policy approved by the Division of Water Supply.

I. **Working Cross Connection Program**

System Category		
CWS (Community Water System)	**NTNCWS (Non-Transient Non-Community Water System**	**TNCWS (Non-Transient Non-Community Water System**

All water systems, including apartment complexes are required to have a cross connection ordinance or policy. In addition, systems must develop an active on-going cross connection program to detect and eliminate or provide protection for any cross connections that may exist in the system. The on-going program must meet the objectives and goals of an approved plan. The plan must address the

identification of potential cross connection hazards, provide for the annual testing of all known devices, and maintain records of visits, tests, follow-up activities, etc. To identify potential cross connection hazards, the system, should periodically review its commercial and agricultural establishments for backflow hazards. Other sites which should be considered include residential customers who previously relied on a water well, utilize an irrigation system, or have a swimming pool. The following factors should be considered when evaluating the effectiveness of a program. (See Rule 1200-5-1-.17(6).)

a. Number of new surveys - realistic for size of system and number of commercial, industrial, and institutional customers not previously visited.
b. Follow-up surveys - promptly conducts follow-up visits, makes telephone calls, etc. until satisfactory corrective action has been taken.
c. Thoroughness of surveys - recognition of hazards.
d. Routine re-surveys - program periodically revisits facilities previously surveyed.
e. Enforcement - water system takes corrective action where voluntary compliance cannot be obtained by cut-offs in service, etc.
f. Records - suitable records are being maintained on surveys; records are kept until the next sanitary survey.
g. Testing - protective devices are regularly inspected and tested by a competent individual.
h. Customer awareness programs to inform public of hazards and how to help prevent

Rating:

3 pts if system does not have a cross connection program that does not survey new customers and conduct follow-up surveys of existing commercial, institutional and industrial customers

4 pts if system does not have a annual testing program of all backflow prevention devices

3 pts if on an initial inspection a system does not have an active program in accordance with the approved cross connection plan (surveys and/or testing incomplete).

7 pts if on a subsequent inspection a system does not have an active program in accordance with the approved cross connection plan

1 pt for failing to have an active public education – customer awareness program.

Appendix 1
(Referenced on page 20)

Sanitary Survey Letter General Specifications

Fonts - Acceptable fonts shall include: Arial, Courier New and Times New Roman.

Margins, Point Sizes - Letter margins shall be (plus or minus 15%) 1 inch at the top, 1 inch at the bottom, 1 inch on the sides. Letters should be written in 12 size point.

Signatures - all signatures on original letters shall be **personally** signed (not stamped, computer reproduced, etc.)

Paper - Letterhead and paper shall conform to current guidance. Guidance dated November 1995 provides for all original letters to be on State Watermark Bond paper. Copies for files, etc. may be copied on copy paper. Letterhead shall be within specifications. This guidance may be superseded at any time.

Appendix 2

PROCESS MONITORING PROGRAM CRITERIA
(Referenced in Section 4.M. on Page 50)

Treatment Process to Address	Analysis
Filtration/Surface Water or Ground water Under Surface Water Influence	Turbidity
Filtration or Aeration/Iron or Manganese	Fe, Mn
Fluoridation/Dental Health	Fluoride
Corrosion Control/Corrosivity	pH, Temperature, Alkalinity, Hardness Jar Test (Once a Week)
Disinfection/Bacteria	Chlorine Residual Bacteriological
Flocculation/Turbidity	Aluminum

Appendix 3
Abbreviations and Acronyms

AL – Action Level

ASDWA – Association of State Drinking Water Administrators

AWWA - American Water Works Association

CCR - Consumer Confidence Report

COP - Certified Operator

CRM - Compliance Review Meeting

CT - Contact Time

CWS - Community Water System

DBP – Disinfection Byproducts

DCA - Division of Community Assistance

DLS - Division of Laboratory Services

DWS - Division of Water Supply

EAC - Environmental Assistance Center

E. Coli – Escherichia coli

EOP - Emergency Operations Plan

EPA - U.S. Environmental Protection Agency

FTC - Fleming Training Center

gpd – gallons per day

gpm - gallons per minute

GWUDI – Ground Water Under the Direct Influence of Surface Water

HAA5 – Haloacetic Acids (five)

HPC - Heterotrophic plate count

IESWTR – Interim Enhanced Surface Water Treatment Rule

IOCs – Inorganic Chemicals

LCR – Lead and Copper Rule

LOA - Letter of Agreement

LT1ESWTR – Long Term 1 Enhanced Surface Water Treatment Rule

MCL - Maximum Contaminant Level

mg/L – Milligrams per litter

MOR - Monthly Operations Report

MRDLs – Maximum Residual Disinfectant Levels

NCO - Nashville Central Office

NCWS - Non-Community Water System

NOV - Notice of Violation

NONC - Notice of Noncompliance

NPDES – National Pollution Discharge Elimination System

NPDWR – National Primary Drinking Water Regulation

NSF - National Sanitation Foundation

NTNCWS - Non-Transient Non-Community Water System

NTUs - Nephelometric Turbidity Units

OCCTR – Optimal Corrosion Control Treatment Recommendation

OGC - Office of General Council

OGWDW – Office of Ground Water and Drinking Water (EPA)

POE – Point of Entry

PN - Public Notification

ppb – parts per billion

ppm - parts per million

pCi/L – picocurie per liter

PWS - Public Water System

PWSID – Public Water System Identification Number

SDWA - Safe Drinking Water Act

SDWIS – State Drinking Water Information System

SOCs – Synthetic Organic Chemicals

SOP – Standard Operating Procedure

SWS - Small Water System

SWTR - Surface Water Treatment Rule

TAD – Turn-Around Document

TAUD - Tennessee Association of Utility Districts

TCR - Total Coliform Rule

TDEC - Tennessee Department of Environment and Conservation

TEMA - Tennessee Emergency Management Agency

TDOT – Tennessee Department of Transportation

TNCWS - Transient Non-Community Water System

TOCs – Total Organic Compounds

TSDWA - Tennessee Safe Drinking Water Act

TT – Treatment Technique

TTHM – Trihalomethanes

UIC - Underground Injection Control

UMRB - Utility Management Review Board

VOCs - Volatile Organic Chemicals

WEHA - Water Environmental Health Act

WHP – Wellhead Protection Plan

WQP – Water Quality Parameters

WWP - Water Well Program